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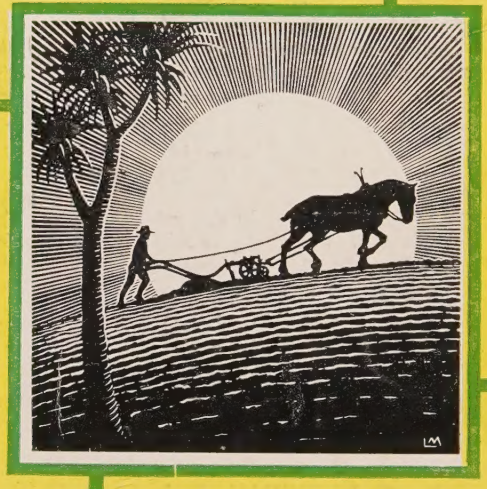

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Published by direction of the Hon. W. LEE MARTIN, Minister of Agriculture.

Vol. 59 WELLINGTON, 15th SEPTEMBER, 1939 No. 3

Eliminate Guesswork In Topdressing

What Do You Know Of The Manurial Requirements Of Your Farm?

P. S. SYME, Instructor in Agriculture, Warkworth.

WHICH is the most valuable piece of land on your farm, and what is it worth to you?

Many farmers might find this question hard to answer. Probably most of them would decide on a particularly rich piece of soil carrying an exceptionally fine sward of grass, and an estimate of its value might be anything from £50 to £100 per acre.

Actually, the most valuable part of a farm may be the poorest, and its value to the farmer may amount to many hundreds of pounds per acre—**if used to proper advantage!** This paradox may suggest an underground river of oil or a vein of gold-bearing quartz, but such short-cuts to affluence are, alas, not found on many farms. Such easily-won riches are not for the New Zealand farmer. He can attain a competence for his old age only by prosaic hard work and by making the most of his acres.

> Although topdressing practice on many farms has reached a very high standard, there are still many farmers to whom topdressing is very largely a matter of guesswork. By means of a few simple manurial trials guesswork can be almost completely eliminated, with a corresponding increase in efficiency and a considerable saving in money.

Potent Weapon

To make the most of his farm, however, the farmer must fight his battle with the best modern weapons which science has made available, and of these perhaps the most potent are the artificial fertilisers. In order to use these effectively the farmer must first know his farm, and must find out for himself what are the reactions of his particular soil to the different kinds of fertilisers so ardently—and indiscriminately—recommended for his use by the various interests concerned.

Each of the recognised manures may be depended on to give excellent results under certain conditions, but if he is to decide just which are best suited to his own farm the farmer himself must experiment. There is at

present no other reliable method of deciding the respective values of the different fertilisers for varying soil and climatic conditions, and only by trials carried out on his own fields can the farmer satisfy himself that he is selecting his fertilisers to the best advantage.

Conducting a Trial

In carrying out a trial (see "Journal of Agriculture," September, 1938) a word of caution may be necessary. It is useless to try out a fertiliser on land which has already received heavy applications of that or some similar fertiliser. Select, rather, a poor sward, preferably one which already contains traces of clovers and the better grasses, and on a soil which is typical of a major portion of the farm.

In judging the effects of the fertilisers, attention should be paid, not so much to an increase in "feed," as to an increase of clover and to any change-over to better species of clovers and grasses. Such a trial, if it is properly carried out and if its lessons are studied and put into practice, will pay high dividends. The piece of land used need not be extensive, and the cost of time and labour is low, but the reward in interest, essential knowledge, and money saved may well result in this poor area being truly described as the most "valuable" part of the farm.

Fig. 1.—Comparison plot of "no manure."

Illustrations

The accompanying illustrations were taken from an official manurial trial.

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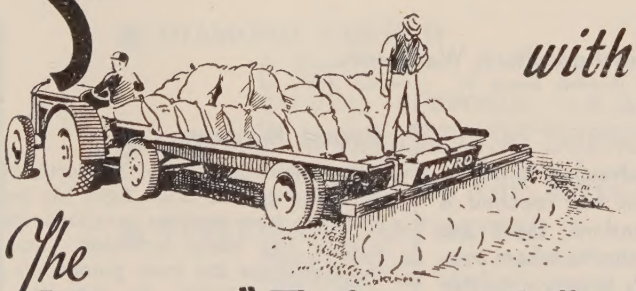

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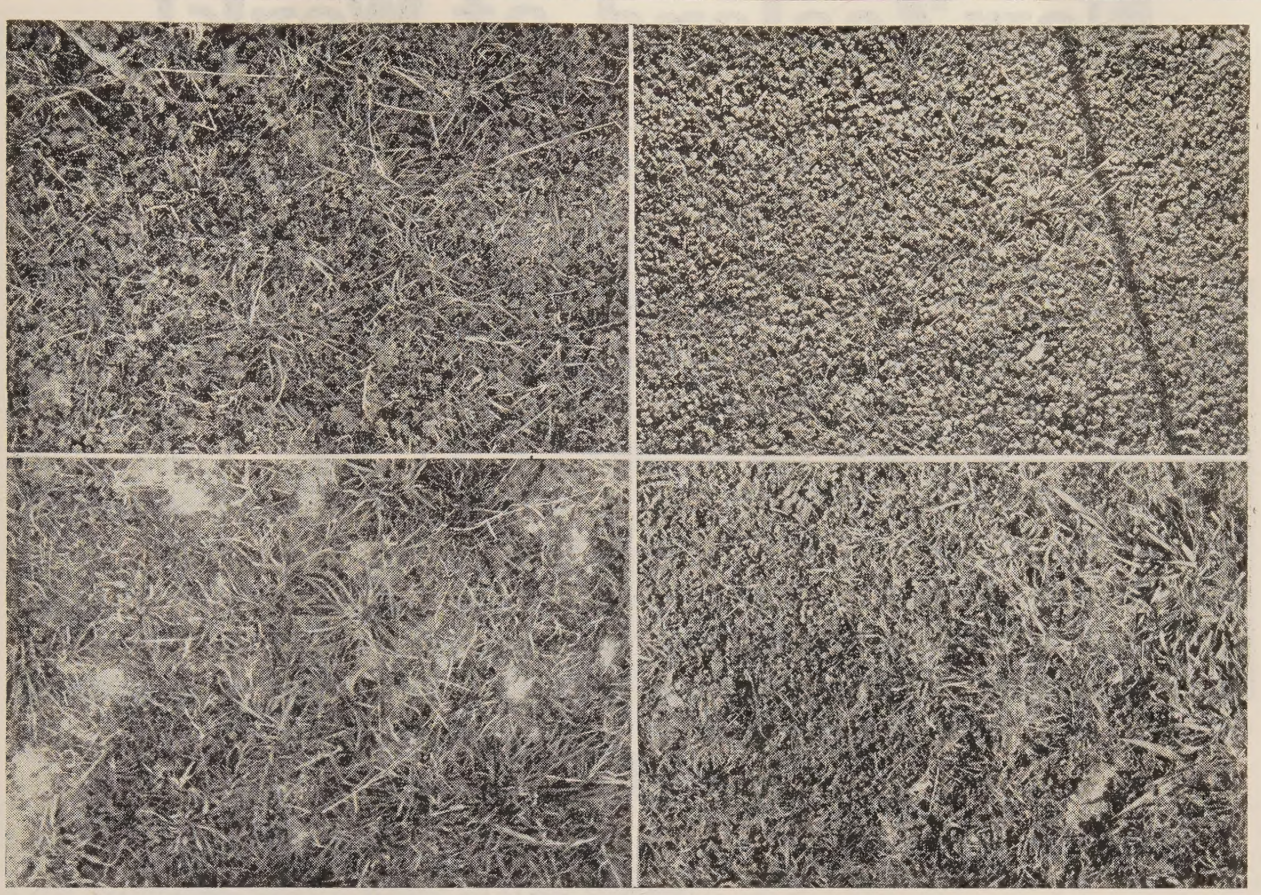

Top (left to right), *Fig. 2:* Treatment "A". *Fig. 3:* Treatment "B". *Bottom* (left to right), *Fig. 4:* Treatment "C". *Fig. 5:* Treament "D".

It should be noted that these results apply only to this particular soil type, and for this reason the fertilisers used have not been named, as this might prove misleading. The information afforded by this trial has enabled the farmer to obtain excellent results at a minimum cost, and to avoid the wasteful use of unnecessary fertilisers.

Fig. 1: "No manure."—This plot is included to afford a comparison with the differently treated areas. Note the complete absence of clovers and the numerous bare spaces.

Fig. 2: Treatment "A."—This fertiliser supplied phosphates only, yet it will be noted that the result is a well-balanced sward of vigorous grasses and clovers.

Fig. 3: Treatment "B."—Phosphates only. The clover development is excellent, but there is a marked deficiency of ryegrass, and the sward is distinctly inferior to No. 2.

Fig. 4: Treatment "C."—The fertiliser employed has had no appreciable effect, yet its cost was approximately 50 per cent. greater than that of "A."

Fig. 5: Treatment "D."—Three kinds of fertiliser were applied to this plot to provide a complete manuring. The treatment is in no way superior to No. 2, yet it cost nearly four times as much. Applied on a field scale it is obvious that much of the money would be wasted, and much more profitable results would be obtained by simply topdressing the farm as in "A." This would permit of a larger area being topdressed for any given expenditure.

Some excellent responses were obtained in the Christchurch and North Canterbury districts this season from the application in spring of sulphate of ammonia (1 cwt.) to wheat which had come through the winter in a yellow condition.

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Breeding Of Saddle Horses And Remounts

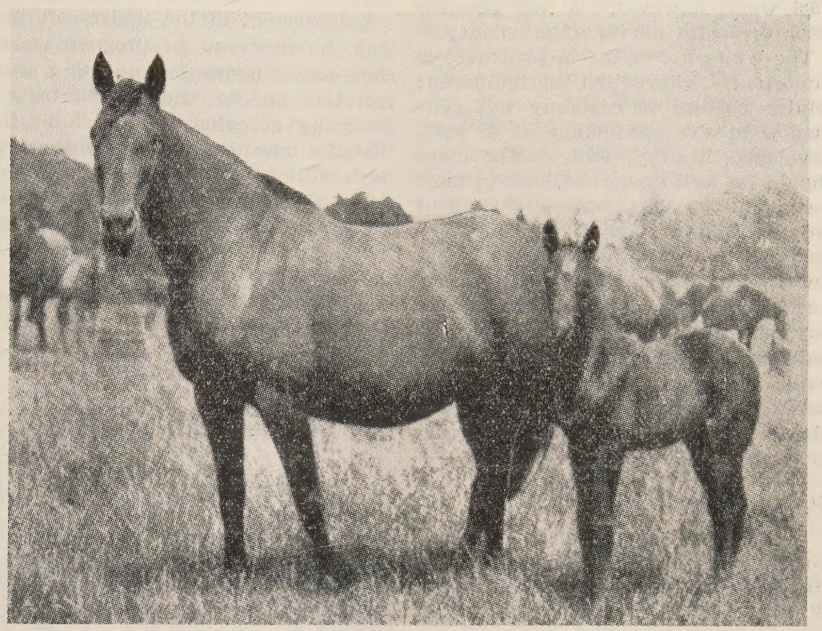
Care And Management of Foals and Young Horses

—By—

W. C. BARRY,

Director, Livestock Division,

Wellington.



A satisfactory response has been forthcoming to the scheme inaugurated to stimulate the breeding of riding horses. It is hoped that all owners who avail themselves of the scheme will do everything necessary to ensure that proper attention is given to the young stock, and to this end the care, management and feeding of foals during the first year of their life are outlined in this article.

TO all those interested in the breeding of saddle horses, the action of the Government in putting into operation last year the powers conferred by the Remounts Encouragement Act, which was passed in 1914, must be regarded as a most valuable movement towards replenishing the number and improving the type of horses of the utility riding stamp suitable for remount purposes. The breeding of this class of animal had been much neglected since the war years, resulting in a definite scarcity of such horses and marked deterioration in the type of animals which were being bred.

The response in the first season must be regarded as very satisfactory, Thirty-two stallions were subsidised under the Act, and the number of mares served in many districts exceeded expectations. The crop of foals during the present foaling season may be between eight and nine hundred.

Scarcity of Mares

Although the standard of the mares, in some districts at any rate, may be criticised by some, a consideration of the existing scarcity must convince anyone that a selective policy of a high standard in the mares is not possible, and will be applicable only after some years of more intensive breeding when the numbers will have materially increased. The outstanding primary urgency is to get saddle horses bred.

In the administration of the Act, the Department of Agriculture has received most valuable assistance from the New Zealand Racing Conference and the New Zealand Trotting Conference. Indeed, it is correct to say that without the financial assistance rendered by the Racing Conference the results of the first season's operations could not have been anything like so successful.

The action of the Racing Conference in making available the services of Major-General R. Young is highly appreciated. General Young's experience and help in organising the work of the various district Remount Committees contributed in a large degree to the smooth working of the scheme in its first season.

The increased interest in horse breeding suggests that some reference to the in-foal mare and to the care, management and feeding of foals during the first year of their existence is not out of place at the present time.

Quality of Feed

The period of gestation in the mare is eleven months. During the first six

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months of pregnancy little alteration need take place in the mare's usual work; in fact, light, slow work is often carried on up to near foaling time. Fast work, however, is not possible after the sixth month of pregnancy.

The wintering of the in-foal mare is important. Starvation on indifferent winter pasture is certainly not conducive to the production of a well-developed, healthy foal. The mare should be well nourished, and in most instances this can be brought about only by the provision of supplementary feed. If the mare's condition becomes low it is an indication of this requirement. With regard to feed, good clover hay should be provided. Chaff of indifferent quality is of low nutritive value, and a daily allowance of good oats is probably better than anything else. A bran mash once or twice weekly is useful for its laxative effect.

Parturition in the Mare

In breeding establishments, roomy boxes, well bedded down with short straw, are provided for foaling mares. When foaling is to take place outside, it is important to select a clean paddock, free from dangerous gullies, etc., and in which no other animals are grazing at the time.

Enlargement of the udder can, as a rule, be observed in pregnant mares some weeks before foaling, and a waxy secretion on the end of the teats is generally accepted as an indication that the mare will foal in one or two days, although it might be mentioned that the appearance of this so-called "wax" is not constant in all mares. With regard to foaling difficulties in the mare, the best advice which can be given is to obtain veterinary assistance as quickly as possible.

Treatment of the Foal

One of the first precautions with the newly-born foal is to sponge the eyes and nostrils free from mucous or attached membrane. To prevent infection through the navel cord, it should be tied about two inches from the belly, using tape which has been steeped in antiseptic. After this ligature is applied, the navel cord is cut off below it and the stump painted with iodine.

Very often the bowel contents of the foal become hard and dry, and the foal is noticed to strain continuously. In such cases an enema of two ounces of warm glycerine should be injected into the rectum and repeated in a few hours if necessary. If this fails to give relief, a small dose of castor oil (two tablespoons) in a little warm milk might be given.

If the mare be short of milk, as frequently happens with foals prematurely born, the deficiency must be made up by giving the foal specially prepared cow's milk.

Motherless Foals

In instances in which the mare dies, or through some accident is unable to suckle the foal, rearing of the foal by hand is often undertaken. This, however, is a laborious task, and calls for unremitting attention to be successful. The best substitute for mare's milk is that of the cow. Cow's milk contains more fat than mare's milk, but less sugar. It must, therefore, be specially

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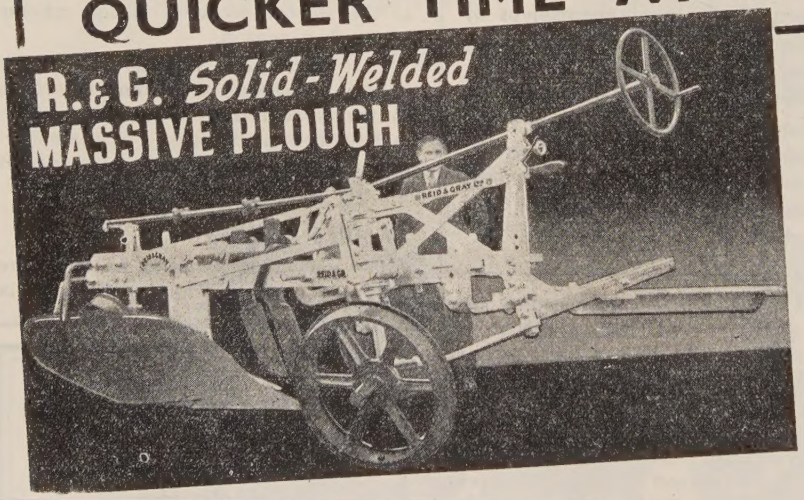

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prepared for the foal. It is advisable to use the milk of a freshly-calved cow and to continue to use this cow's milk throughout.

The milk should be diluted with slightly warm water in the proportion of one part water to two of milk, a small quantity of sugar being added. As the foal grows older, one part of water to three of milk is recommended. The milk must be fed lukewarm, as cold milk will, in all probability, give rise to digestive disturbance and diarrhoea.

Half a pint of milk should be given every half-hour, and as time goes on this quantity is increased, with the intervals between feeds extended. Regularity in times of feeding and strict attention to the scalding of milk vessels is essential.

Digestive Troubles

Diarrhoea is probably the most common symptom of digestive disturbance in the foal. The cause might be irregular feeding, such as happens when a mare is at work and away from the foal for long intervals, or it may be that the mare produces a heavy milk secretion, resulting in the foal getting too much. Very occasionally the mare's milk is overrich in fat, which will cause scouring in the foal.

It is obvious, therefore, that the cause of the diarrhoea must be looked for, and, if possible, removed. As regards actual treatment of the foal, the use of astringent or binding medicine must not be immediately resorted to, and a dose of castor oil, by removing the exciting cause in the intestine, will probably have a much more beneficial effect.

Weaning and Wintering Foals

There is an old saying among horsemen, in which there is a good deal of truth, that a horse is either made or ruined during the first year of his life. The primary object of this article is to emphasise to breeders the necessity of doing the foal well in its first year. If the foal is worth breeding at all it is surely worth while to feed properly and provide necessary shelter during this the most critical period in the formation of the animal.

One has only to contrast the appearance in size and development of the thoroughbred yearlings seen at sales and breeding establishments with the under-developed yearlings so often seen on farms, the latter bearing every evidence of lack of attention and existing on nothing more than a maintenance grass ration. Yet the size and development of the yearling turned out by the stud breeder can be attributed solely to improved management and feeding.

When the mare is again in-foal, weaning usually takes place during the fifth month. A considerable time before separation from the mare the foal should be receiving a little crushed oats, bran, and chaff daily to assist in preventing a setback when weaned. By feeding hay to the mare before weaning, the foal will learn to eat it, and will be in a better position to fend for itself when separated from the mare.

While it must be admitted that environment of climate, soil, and pasture contribute to bone and growth in young horses, resulting in some areas being famous in producing outstanding animals, there is no reason why good results should not be obtained generally, provided feed and shelter are attended to in the wintering of young horses. When indifferent winter pasture prevails supplementary feed becomes essential.

Superiority of Oats

The superiority of oats as a grain for horses is well known, and probably no other food will produce as good results. A foal at weaning time should receive 2lb. of crushed oats daily, with plenty of hay. The quantity of oats is increased up to 4lb. per day for a yearling. Well-saved clover hay provides lime, which is very necessary to the growing animal. The addition of 1lb. of bran to the ration occasionally is useful for its laxative effect, and also because of its phosphatic content.

In the wintering of foals a word is necessary regarding shelter. Without some protection from the wind, even well-fed young animals will not respond as they should. Horses will stand up to rain, and even snow, but

what they do not like is wind. If natural shelter is not available in the paddocks a shelter shed into which they can go in bad weather should be provided.

Owners' Responsibility

It is to be hoped that all owners who avail themselves of the services of subsidised stallions for their mares will do everything necessary to ensure that proper attention is given to the young stock. By so doing they will help to contribute to the success of the scheme inaugurated to stimulate the breeding of riding horses.

Are YOU also throwing good fertiliser away?

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Grasses And Clovers Of New Zealand

Value of Different Varieties To The Pastoral Industry

S. H. SAXBY, Instructor in Agriculture, Dunedin.

Fig. 1.—A wide range of habitats involves an equally wide range of pasture plants.
[S. H. Saxby, photo.

With this article the author begins a series of illustrated articles on the main constituents of New Zealand's pastures. The writer not only helps the farmer to identify the different species of grasses and clovers, but also states their value under the varying conditions of soil and moisture. Information of this nature is continually being sought by farmers, and there is no doubt that these articles will fulfil a widespread demand.

THE apparently simple and direct question, "What is this plant, and is it of any value?" is frequently asked, and an equally direct answer is often expected. A plant can usually be identified with both speed and accuracy and the matter ends there, but the evaluation of any species cannot be given with any degree of precision unless many other factors are considered. For example, brown top on first-class country is rightly regarded as being of very little value, but on some second and third-class hill country it is a very important pasture plant. Again, certain thistles are weeds on some country and useful plants on other country (Fig. 2).

It may, therefore, be seen that the value of a plant depends not only on itself but also on the conditions under which it is growing or is to be grown.

In these articles attention is chiefly centred on the values of the various pasture plants in relation to these conditions, which can be broadly collected into three groups, namely:

(a) The plant itself.

(b) The habitat under which it will thrive or is of consequence.

(c) The management necessary to obtain the maximum return from it.

Establishment of Plant

(a) THE PLANT ITSELF.

The first important factor is that of establishment. Some plants establish from seed only, some from roots only, and some from both. Examples of these three are ryegrass, old man twitch, and Californian thistle respectively. Time of establishment is also an important consideration. Certain plants will normally establish only in the spring, some will establish all the year round, while others will establish very successfully in the late autumn.

Fat hen, for example, will establish only in the late spring, and is consequently a serious weed in spring-sown crops only. The fact that alsyke (Fig. 3) will establish better than red clover in late autumn sowings no doubt accounts, in part, at least, for its popularity in the southern districts.

Speed of establishment has also to be taken into consideration in determining a plant's worth. On "dirty" country the quick establishment of pasture plants is very valuable as, in addition to the early feed produced, the smothering effect on undesirable volunteer plants is an important matter. Two contrasting plants in this respect are ryegrass and *phalaris tuberosa.* The latter is very slow to establish, and is easily dominated by associated plants in the young stages.

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Fig. 2.—Winged thistle on most country is rightly regarded as a weed, but in parts of Central Otago it produces comparatively useful feed.
[*S. H. Saxby, photo.*

Seasonal Production

There is also the question of seasonal production. Plants vary greatly in this respect. Of the more common pasture plants early production is exemplified by ryegrass and prairie grass and late production by *paspalum dilatatum* and timothy.

Other factors, such as rapidity of recovery after grazing, drought resistance, and disease resistance, all play a part in determining a plant's value (Fig. 4). Habit of growth varies greatly in the various pasture plants. Some plants, such as cocksfoot and red clover, are erect-growing and high crowned; others, such as ryegrass, are low crowned but erect growing. Creeping, bent, and white clover are low-growing and creep along the surface of the ground, while Kentucky blue grass, old man twitch, and Californian thistle creep by underground stems.

The length of life of the various plants is a very variable and important matter. Some will last for one year, some for two years, and others for many years. For permanent pastures perennial plants should obviously dominate the mixture sown. Yet many pastures which are expected to remain permanent have been sown with short-lived plants.

Depending on whether a weed is long-lived or an annual, so can methods for its control be decided upon. One would not think of trying to control annual weeds with the special smother crops which are so valuable in the control of perennial weeds, such as twitch.

Both feeding value and attractiveness to stock are important, although they are frequently misunderstood and overstressed. Nevertheless, there are wide differences regarding these conditions in the various plants. The significance of both of these is dependent very largely on other circumstances, which are described under "habitat."

Fig. 3.—Alsyke establishes better in the late autumn than red clover.
[*S. H. Saxby, photo.*

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When Will a Plant Thrive?

(b) HABITAT.

This is a term which covers a wide range and combination of factors which mould the destiny of a plant and which are responsible for its well-being or non-survival. Every plant has what is termed a habitat range, that is, a particular set of conditions under which it will thrive. Outside this range of conditions the plant will die or grow

so poorly that it will be replaced by some plant which will thrive there.

To become of real importance a plant must tend to become a dominant where it is growing, and to do this it must thrive in competition with other existing plants (Fig. 5). For example, practically all the native grasslands of New Zealand, although composed of many species of plants which varied greatly in size and habit of growth, were, in the absence of the grazing animal and the human factor, almost entirely dominated by grasses of a tussock form (Fig. 6). Under the conditions which then existed, conditions were ideal for the growth and increase to dominance of shade-making and shade-enduring grasses where other conditions were suitable.

With the advent of man and the grazing animal this dominance has been changed to those plants which will dominate under the changed conditions of grazing, haying, ploughing, or burning.

Fig. 4.—Marram grass is valuable because it is a couch or twitch, and on this account it is able to act as a sand-binding plant.
[*S. H. Saxby, photo.*

Fig. 5.—The little yellow-flowered musk plant exemplifies very clearly the significance of the term "habitat range." Here it has established and is thriving in only the lowest lying parts of the paddock.
[*H. Drake, photo.*

Influence of Climate

Of the various conditions which determine the limits of a plant's habitat the following are the most important:—

(1) **Climate.**—Although some plants will grow under a very wide range of climatic conditions, a number are restricted in their distribution on account of these conditions being unsuitable (Fig. 7). For example, paspalum will grow on a fairly wide range of soil conditions, but it is limited in its use as it will thrive only in a warm climate. On the other hand, ryegrass will thrive under a very wide range of climatic conditions, as is evidenced by its general use throughout the country.

(2) **Soil Moisture Content.**—Plants vary greatly in respect to their tolerance and requirement of moisture. Plants such as floating sweet grass or reed sweet grass will thrive only under the wettest of conditions, where others. such as ryegrass, will die (Fig 8). Further up the scale one comes to

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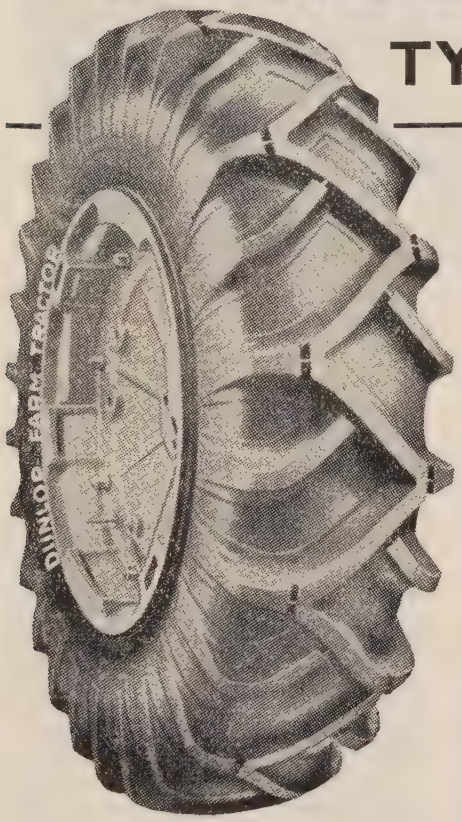

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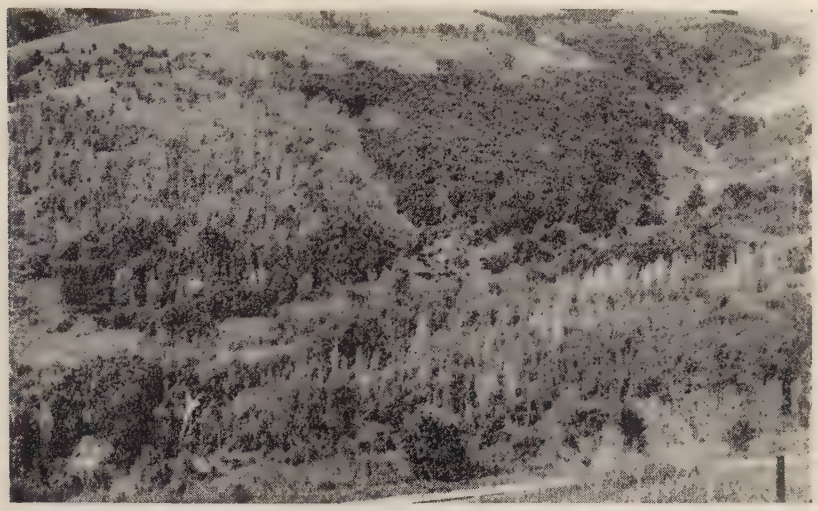

Fig. 6.—**Manuka is of importance on this country only because it tends to become the dominant plant. This condition is usually equally true with regard to useful plants as well as useless ones.**

[*H. Drake, photo.*

brown top, which will thrive where it is too dry for ryegrass, and danthonia will, in turn, thrive where it is too dry for brown top.

Every plant has a definite range of conditions of moisture supply under which it will grow or thrive. For some plants this range is very wide, while for others it is very narrow. Creeping bent grass, for example, has a very narrow soil moisture range, whereas that of tall fescue is comparatively wide, as it will grow well on both dry and very wet soils, although doing better on the latter.

Effect of Fertility

(3) Soil Fertility Requirements.—Of the common pasture plants white clover furnishes the most striking and common example of this. Wherever the soil is low in available phosphate clover will not thrive, irrespective of other conditions. As soon as the available phosphate supply is increased, the clover will thrive.

Just as available phosphate limits the vigorous growth of many legumes, so does the supply of available nitrogen limit the growth of the majority of grasses. (Fig. 9). The value of many of our most important grasses is thus dependent to a very large extent on the amount of nitrogen available for them.

Some plants, such as ryegrass, demand a constant and large quantity of nitrogen in order to thrive. Other plants, such as sweet vernal, will grow where the supply of nitrogen is much lower. In our pastures the supply of available nitrogen is governed largely by the amount of clover present, with the result that in order to maintain vigorous growth of high producing grasses a vigorous growth of clover is almost always essential.

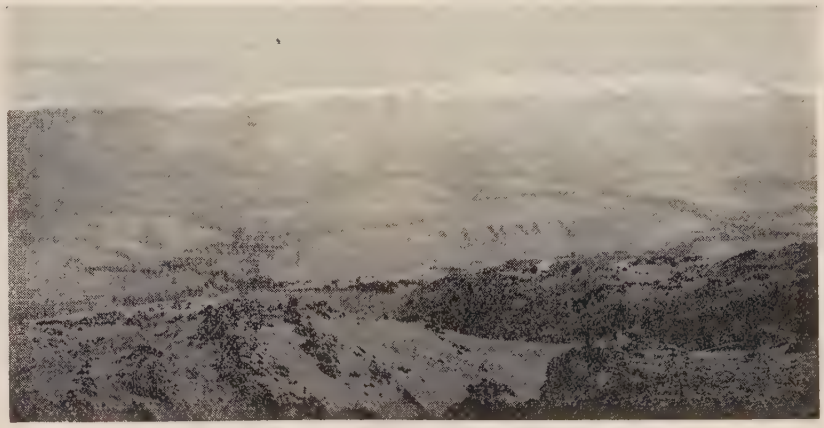

Fig. 7.—**Climatic conditions, whether hot or cold, wet or dry, influence to a very large extent the distribution of both native and introduced plants.**

[*S. H. Saxby, photo.*

(4) Light and Shade and Association With Other Species.—Recognition of this factor plays a part not only in the maintenance of pastures, but also in the control of certain weeds which succumb to the smothering effect of other species. This factor is also of considerable importance in pastures as a whole.

Fig 8.—**Certain plants will thrive under the wettest of conditions. Here reed sweet grass is thriving in a water course. At the other extreme, danthonia will grow when conditions are too dry for plants such as cocksfoot or ryegrass.**

[*H. Drake, photo.*

Danger of Smother

As has been previously pointed out, the uncontrolled growth of a mixed sward will eventually result in the dominance of bushy, tall, erect-growing plants (Fig. 10). This is turned to advantage in certain pastures where the dominance of this type of plant is required. In order that cocksfoot shall remain the dominant plant in seed-producing pastures every effort is made for it to assume a dense, tall-growing sward, with a resultant decrease in the shorter-growing plants due to smother in the young stages.

In the establishment of pastures the effect of light and shade plays a very significant part. The shading effect due to very vigorous and quick-establishing plants may result in the partial or complete failure of slower-growing species. A vigorous growth of fat hen in spring-sown pastures will often materially affect the establishment of much of the slower-growing ryegrass.

Similarly, a vigorous growth of ryegrass will also affect the establishment of the slower-growing cocksfoot and white clover. Where there is a scant amount of shade, especially in the autumn, conditions are ideal for the establishment of annual plants, some of which become aggressive later on. The control of annual plants lies mainly in the provision of shade in the form of a dense cover of useful plants.

Fig. 9.—**Nitrogen, whether it is supplied by the stock, the clovers, or by artificial manures, is the most important element, the presence of which promotes the healthy growth of grasses.**

[S. H. Saxby, photo.

The foregoing factors—namely, climate, soil fertility, soil moisture, and light and shade—all combine to make

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- Basic Slag is a phosphatic fertilizer and it is important to note that the phosphates it contains are in non-acid form.
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- Basic Slag helps to keep the soil non-acid, thus promoting correct soil conditions.
- Basic Slag stimulates nodule formation in the leguminous plants, which results in an increase of that natural phenomenon, the fixation of atmospheric nitrogen.
- Basic Slag, owing to its basic nature tends to liberate the potash from the minerals in the soil, where it is locked up and inaccessible to plant life.
- Basic Slag has a tonic effect on the soil, the importance of which is increased by the minerals, such as iron, manganese, magnesia, etc., which it contains.

Fig. 10.—The native grasslands of New Zealand, which were evolved in the absence of the grazing animal, made uncontrolled growth, which favoured the dominance of tussock forming plants. As soon as the grazing animal and the firestick were introduced, short-growing plants gained the ascendancy.
[*S. H. Saxby, photo.*

up a habitat. According to the manner in which these factors are associated in various localities, so can one forecast the plants that are most likely to thrive in them, whether they are weeds or useful plants.

Importance of Management

(c) MANAGEMENT.

This aspect frequently plays the most important part in the evaluation of a plant. Under some systems of management a plant may thrive and be useful; under another system of management and under similar conditions the same plant may be practically worthless. As the whole question of management warrants much more space than can be devoted to it here, only brief reference will be made to it in this article.

Management is a combination of many factors, such as the nature of seeds mixtures sown, the methods adopted in the eradiction of weed plants, the frequency and closeness of grazing, and the effects of burning (Fig 11). All these factors, either singly or in combination, may alter the whole outlook regarding a preconceived idea of a plant's value.

From the foregoing it will be realised that the question of deciding the value of a plant is not a simple one, but it is greatly simplified if the conditions under which the plant will thrive are known.

One point will stand repetition—**a plant to be of value must thrive and not merely exist.**. A plant that is merely existing in a pasture may in many cases be replaced by one that is thriving, although under other conditions it may be a poorer plant. After all, throughout all branches of farming, whether it is in the growing of livestock, cereals, root crops, or pastures, the main objective is to obtain thrifty well-grown individuals.

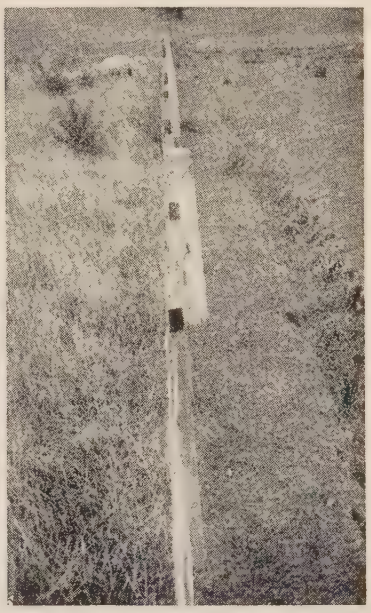

Fig. 11.—Efficient pasture management should aim at the growing and utilisation of feed produced by those plants most suited to the existing or induced conditions.
[*S. H. Saxby, photo.*

The Grasses

In the subsequent descriptions and discussions on grasses only those which are well known or are of economic importance are considered, as details regarding uncommon ones or those of little importance to the farmer would be of passing interest only and of little practical value. Some of the grasses which are considered may at first sight appear to be of little value, especially if they are not well known. Such

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grasses as reed sweet grass, marram grass, and *paspalum dilatatum* may appear to some to be of little value, but to others they are of considerable importance.

In addition to the discussions on the grasses, a very brief description of the chief vegetative characters is given where it is thought that this may assist in the differentiation of somewhat similar grasses. As has been pointed out, most plants have a definite habitat range, and this fact, if fully appreciated, can often assist greatly in the identification of a grass. For example, if a grass is found growing in a swamp one would never think of it being marram grass, which grows in sandy situations. Conversely, one would not expect to find floating sweet grass growing on the exposed face of a poor hill.

In the descriptions of the grasses the use of several botanical terms is unavoidable, and in order that they may be understood the following explanations may be of assistance (Fig. 12).

Sheath.—This is the portion of the plant which is leaflike in character and encircles the flowering stem and the vegetative shoot. The nature of the sheath varies in a number of grasses. In some it is hairy, and in others it is hairless. In some it is flat, and in others it is round in section.

Ligule.—This is of a membranous nature, and is situated on the inner side at the base of the leaf, where it joins the sheath. The ligule varies greatly among the grasses in size, shape, and translucency. The knowledge of the features of the ligules of the various grasses is of great assistance in identification. The ligule is large in cocksfoot, and small in ryegrass.

Ears or Auricles.—These are a pair of ear-like projections opposite to the ligule and attached to the top of the sheath. There is considerable variation in these, the best examples being their prominence in wheat and barley and their absence in oats.

Hairiness.—The presence or absence of hairs on the various parts is another very variable character. On the leaf of tall oat grass, for example, the hairs on the leaf are arranged in parallel lines which run the length of the blade. In sweet vernal the hairs are prominent on each ear.

Other variable features, such as the width and the shape of the leaf, the type of rooting system, and the colour

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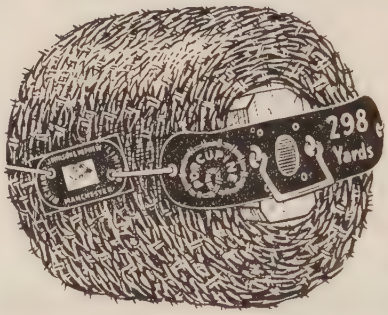

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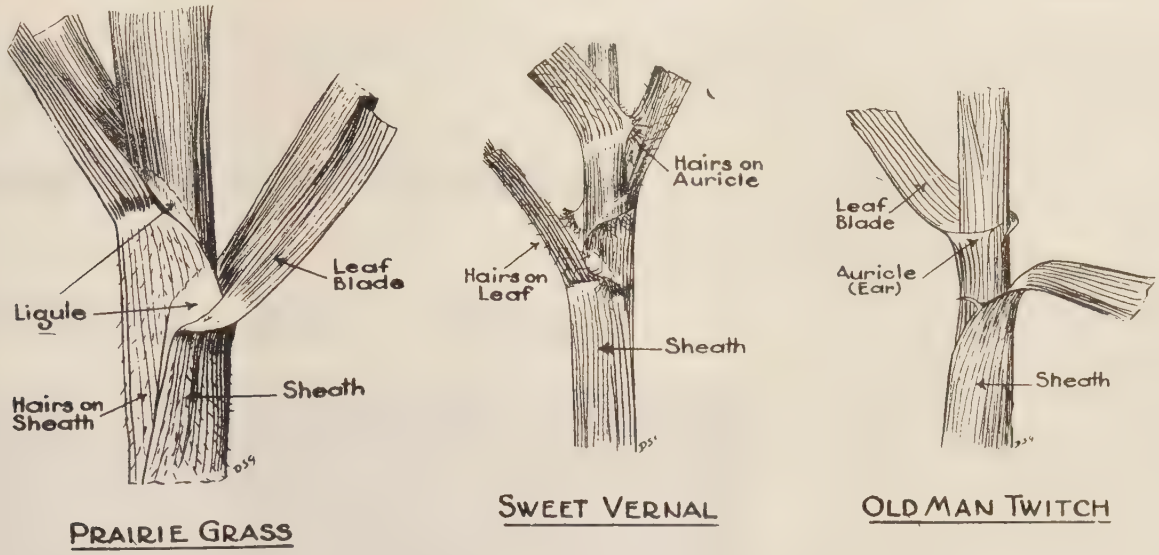

Fig. 12.—**The chief botanical characteristics by which grasses are identified.**

[Drawn by D. S. Gray, Lands and Survey Dept.

of certain parts, are dealt with as the various grasses are described.

Rhizome.—A creeping underground stem. Twitches have this type of stem.

Stolon.—A creeping overground stem, exemplified by creeping bent.

Habitats Classified

For the sake of convenience the grasses have been arranged according to the habitats under which they thrive or are most commonly found.

(a) Grasses which thrive on margins of lakes, swamps, and lagoons.

(b) Grasses which thrive under saline conditions.

(c) Grasses which thrive on country that is poorly drained or that has a high water table.

(d) Grasses which thrive on country of high fertility, which is well drained, and which has a good supply of moisture.

(e) Grasses which thrive on soils of medium fertility and moisture content.

(f) Grasses which thrive on soils of low fertility and moisture content.

(g) Grasses which thrive on loose or consolidated sand country.

Although these grasses have been placed in well-defined groups, it must be realised that some of them may grow quite well and be of value under several sets of conditions. Thus *poa pratensis,* which is placed in Group D, is also of value under conditions set out under Group F. It is hoped, however, that this arrangement may be of value in assisting those requiring a grass for a particular set of conditions. For example, all the swamp grasses are grouped together and all the dry hill country grasses are in the one group.

(To be continued.)

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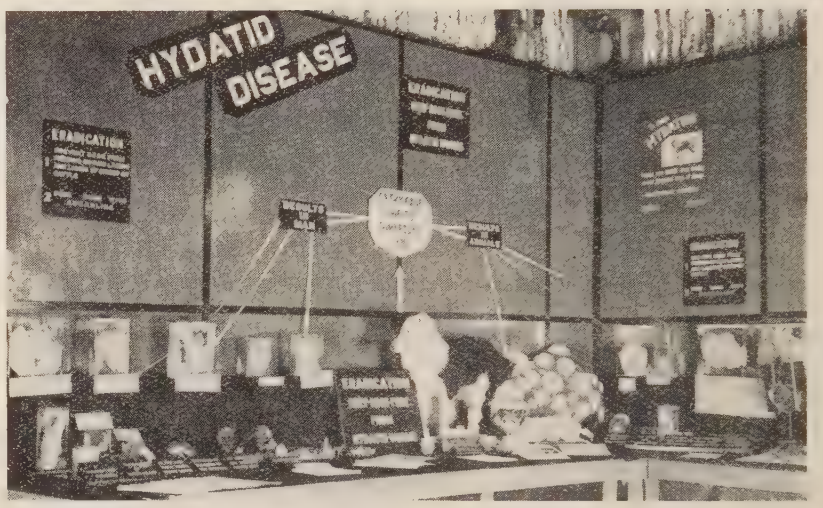
Hydatids Campaign

Although there is a unanimous desire on the part of the public to take every possible measure to banish hydatid disease from New Zealand, there appears to be some doubt as to the correct method of administering the arecoline tablets which are supplied to every dog-owner on payment of the annual licence fee. In this article Dr. Bennett, who has given many demonstrations on the method of dosing dogs, shows how simply this important duty may be carried out.

Undosed Dogs a Menace to Humans and Livestock



An agricultural show exhibit illustrating not only the origin of the disease from the dog and the means of eradication, but also the results of parasitic growths in human and animal organs.

Correct Method of Administering Arecoline

By
DR. E. W. BENNETT,
Research Officer, Department of Hydatid Research and Prevention, Otago Medical School.

REASONS why the regular dosing of dogs for hydatids has become essential are:—

(1) Protection of Human Health and Life.—Up to date (1939) there have been about 3,500 cases of hydatids in the public hospitals of New Zealand, every one contracted from an undosed dog.

(2) Protection of Farm Animals.—Fully half the sheep and cattle have hydatids. Nearly all farm stock more than a year old are infected with similar diseases due to dog-spread parasites. All these diseases can be eradicated by dosing dogs with arecoline.

(3) The Health of the Dog is quite a minor consideration in comparison, but there is also an immediate marked improvement to the dog after removal of worms.

Arecoline is the best remedy for all tapeworms, and the only one that has proved satisfactory for removal of hydatid worms. Although a powerful, fast-working, purging medicine, it is safe and reliable, and in the vast majority of cases not discomforting to the dog. It can be used with complete confidence if instructions are followed. Avoid overdosage, which may distress the dog without giving better results.

Business-like Plan

Regard the arecoline treatment as an urgent necessity, and to this end:—

(1) Keep a box containing all dog paraphernalia handy in a shed, including arecoline, instructions, and a collection of aspirin or essence bottles.

(2) Keep a record on a card of the dates of the arecoline treatment, which needs to be repeated every three months.

(3) Give orders that all dogs on your property are to be freed and kept free from worms by regular dosing and by preventing them from feeding on offal. Dogs brought on to the property by musterers, drovers, rabbiters, can be treated on the spot if necessary.

Improved Method

A good plan—not usually necessary in the case of working dogs, but chiefly recommended in the case of pets or fat or old dogs, and especially dogs from pedigree stock—is to prepare the animal beforehand and try a smaller dose of arecoline than that otherwise required. A day or two before treatment give an opening medicine, such

as paraffin or glycerine, and allow only sloppy food without bones; a small dose of arecoline may then prove sufficient.

For example, for a terrier first try half a tablet (⅛ grain), and use the full ¼-grain dose a few days later if the small dose proves insufficient. Collies and other large, strong breeds usually require two tablets (½ grain).

In any case, starve the dog for 18 or 24 hours. Most dogs respond better away from the kennels (Fig. 2), but keep the dog on the chain in order to verify that the treatment has been successful, and also to destroy the infective material passed by him by burying or burning.

To Prevent Vomiting

Dogs can vomit almost at will, and some will do so when given any medicine. Vomiting is not a sign of distress or cause for alarm, but it interferes with treatment, as the dose may or may not have been lost.

To prevent vomiting, give either 1 or 2 grains of chloretone (seasickness remedy) half an hour before the arecoline, or else hold or tie the dog's head up high and tight for 5 or 10 minutes after dosing.

If the dog vomits, do not dose again at once, but give half a dose if necessary in half an hour or an hour.

Other Methods

The method shown in the pictures is so easy and simple that no other is recommended unless a dog is exceptionally vicious or sly. In such a case, give the arecoline or other medicine in a very small drink of milk or gravy. Avoid freak methods.

Only as a last resource should the arecoline tablets be given embedded in butter, but never in meat. Whole tablets of arecoline are liable to act less effectively, and occasionally to cause an upset.

Other Remedies

Crude and inefficient remedies, such as areca nut, are not recommended. Arecoline is the purified extract of areca nut, free from harmful drugs, and accurately standardised Some other remedies can remove the larger worms, but not hydatid worms.

Puppy worms are of quite a different type. They are not tapeworms, and do not cause the spread of disease in man or animals. They can cause stunting of growth, sickness, and even death, in puppies. For prevention, at about the time of service, preferably just before the heat period, dose the bitch with a preparation containing chenopodium oil or santonin, or both. Bath her and destroy any bedding, and sterilise the kennel and whitewash with lime. Repeat this sterilising just before whelping. Dose the pups with the same medicine at, say, five and seven weeks.

The arecoline treatment should be started at three months in the case of country collies and other large breeds, and at six months in other cases. Repeat four times a year.

Show Exhibit

The agricultural show exhibit necessarily incriminates the dog as the sole source of hydatid disease—"Every Case Due to Somebody's Dog." The specimens showing the ravages of the disease in human and animal organs put an end to all argument or indecision. The wall placards explain the means of eradication—"Keep Dogs Free From Hydatid Worms."

The way to do this is also stated:—

(1) Prevent dogs from feeding on livers or lungs of sheep or cattle.

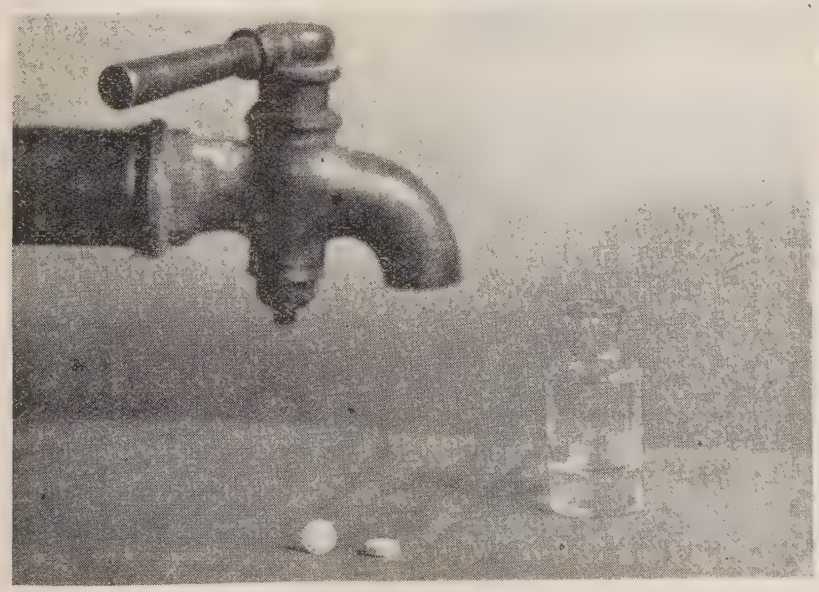
(2) Dose dogs with arecoline.

The carrying out of these precautions is a responsibility which must not be regarded as optional.

To default is to defeat the efforts of farmers and others who recognise the necessity of new standards of hygiene, and realise that the undosed dog is a menace not only to livestock production, but also to human health and life.

All photographs used in this article were taken by H. Drake, Department of Agriculture, Palmerston North.

Here is a Simple Way to Dose Your Dog With Arecoline—



1.—Dissolve the tablets in about a teaspoonful of water in a small bottle.

2.—Chain the dog away from the kennel

3.—Even a vicious dog can be handled if approached with confidence. Spend a few moments in making friends.

4.—Have the bottle handy; then take two fingers, and—

5.—Put them into his cheek to make a pouch.

6.—Grip firmly against the palm of the hand.

7.—Pour the medicine in; head up, cheek gripped firmly.

8.—If he does not swallow at once, squeeze his gullet.

Trials with Babala Grass

Babala grass, which is understood to be of South African origin and in function (and probably botanically also) related to the millets, has been tried out by one or two farmers in the Wairarapa over the past two seasons. Its performance has not been impressive, but in some quarters it is considered worthy of further trial. Three and a half acres of Babala grass grazed at about 18 inches, eight weeks from sowing, fed 35 cows between milkings for three weeks. Subsequently, one-week spells gave about one day's feeding. The country is fairly good river silt. The cows are said to have relished it and milked well.

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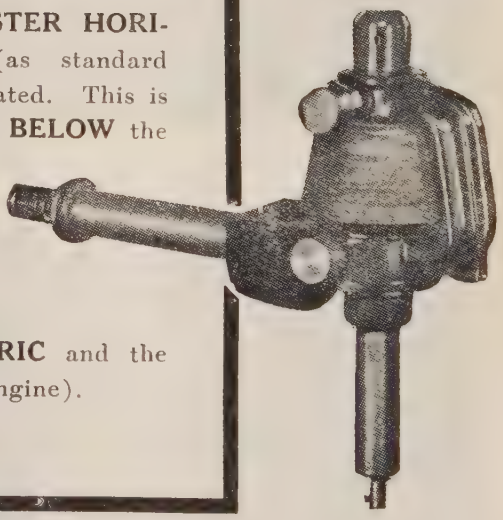

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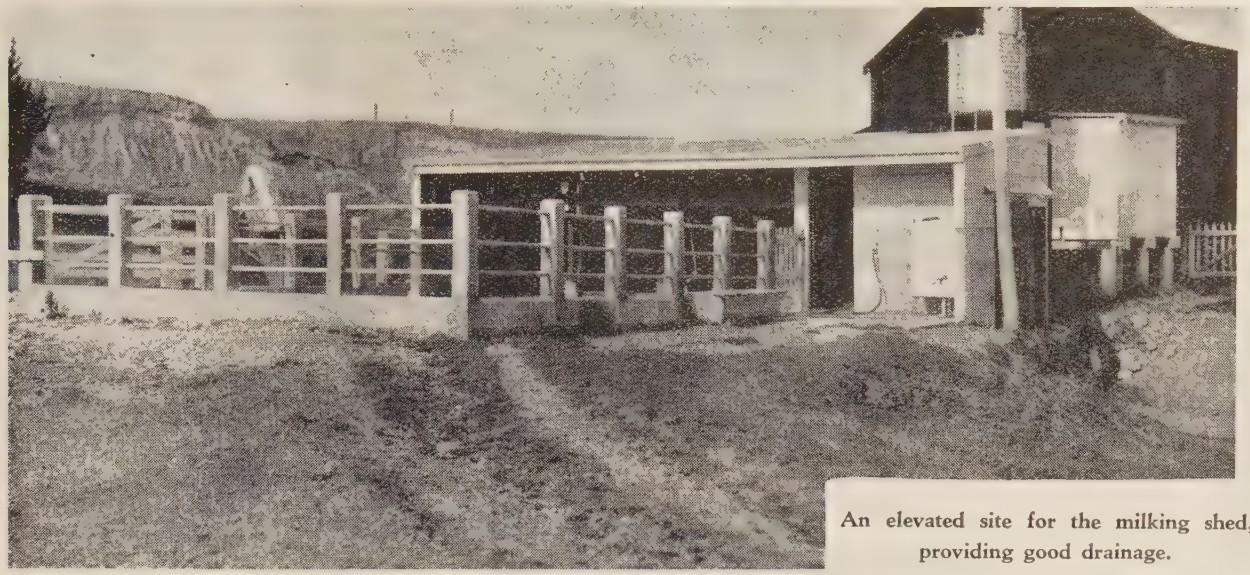

An elevated site for the milking shed, providing good drainage.

Milking Shed Equipment

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FURTHER points in connection with the erection of the milking machine are brought out in this article. It is generally accepted by farmers that the use of the releaser has slowed down milking, and the example of one man who milked eighty cows without any assistance and used a bucket plant in preference to a releaser may be quoted. His reason for doing so was that he considered he saved sufficient time through the reduced stripping required to more than balance the extra work of carrying the milk away.

There is also little doubt that the releaser has resulted in milk which should not be used for manufacture being delivered for that purpose. The desire to avoid this—and for convenience in dealing with milk for calves and household use—has created a demand for a machine which will release in the bail. The open bucket machine may be used for any particular milk which is to be kept separate—for instance milk required for the farm home, or for calf feeding, or colostrum or diseased milk.

It is accepted that the lower the overhead milk pipe can be placed, the lower will be the vacuum which is required to raise the milk to the releaser. Present-day thought is tending in the direction that this is beneficial to the health of the cow.

For this reason a number of vacuum devices have recently been offered for sale. These follow the principle that, while providing sufficient vacuum to raise the milk, they prevent the full effect of the vacuum being exerted on the cows' teats. None of these devices has been long enough in use to enable their merits to be determined.

On the other hand, a low milk pipe creates a difficulty where it is desired to run the milk over a cooler into cans which are standing in the delivery vehicle or on a milk stand. In some sheds the releaser is raised 8ft or so from the floor, while in others a lift-

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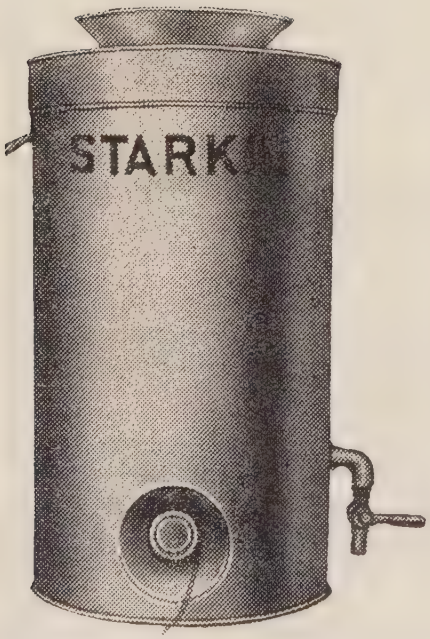

The "Starkie" Dairy Heater, illustrated below, CAN be installed in the same room as the Releaser or Separator—because the "Starkie" is operated by Electricity.

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ing can or other device, operated by vacuum, is used.

At the other extreme, a recent innovation is the erection of the milk pipe and releaser as near the floor as possible, the object being to reduce the milking vacuum. This again requires some means of lifting the milk to the cooler or separator vat.

Cleaning

The immediate concern of the Farm Instructor is the care which is necessary to keep these appliances clean, and the regulations are very comprehensive on the design of the machine from a cleaning point of view. Before the farmer gives a clearance to the erecting engineer he should ask a Farm Dairy Instructor to inspect the installation. This inspection will ensure that everything is right before the plant is used, and costly and inconvenient alterations later on will be avoided. Unless an efficient supply of water, both hot and cold, is provided it is impossible to keep a milking shed and plant properly clean. The cold water is required to keep the yard and shed in the conditions necessary to maintain a clean atmosphere, and, as air is admitted at a number of points on the milking plant, the purity of the air has a direct influence on the quality of the milk produced.

An internal race shed with wooden bails and the sides of the dummies hinged.

At the relief valve, which regulates the vacuum, there is a constant stream of air being drawn in, and if this valve is placed on the milk pipe the air is mixed with the milk and discharged with it. Air is admitted when changing cups. The admission may occur at some point on the claw, at the pulsator, or at the release valve to the releaser; while in the single pipe

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machine it is withdrawn from the back of the inflation, and in all cases is discharged with the milk. Any impurity in the air must obviously affect the milk with which it is mixed.

Water Heater

This contamination, however, is comparatively small compared with the contamination which results from contact of the milk with the deposit left in a poorly-washed milking machine. This inoculates the whole of the milk which passes through it with the germs which cause decomposition. To ensure a pure milk supply and efficient water heater must be provided and used, and these are of many kinds.

The important point in a water heater for use in a dairy is its ability to produce boiling water in sufficient quantities for washing and scalding the milking plant and utensils.

The regulations require an adequate supply of hot and cold water in all dairies in which a milking machine is used. Exhaust and chip heaters, once very popular, are not regarded as being adequate, and can be ruled out. A copper of the modern type is quite satisfactory, as it provides water which is actually boiling, and in which all the smaller utensils can be dipped. It can be refilled and boiled as often as required.

Use of Steam

Low-pressure steam generators, which provide both boiling water and steam at sufficient pressure to force it through the pipes of the milking machine after washing has been completed, are quite efficient. They do not require a certificate of inspection. Experience shows that the necessity for the provision of a supply of fuel for this type of heater or for a copper frequently leads to neglect and inefficient cleaning. Steam is an undoubted advantage, and in a machine which has already been thoroughly washed, steam gives the finishing touch.

Heaters in which super-heated steam is produced will, unless great care is exercised, heat the pipes to a temperature which will melt the solder in the joints and also destroy the rubbers. They should therefore be installed at some distance from the end of the pipe to which they are connected.

In the average dairy where there is no surplus labour an efficient electric heater will give every satisfaction. The one drawback of the electric heater, apart from power failures, which are infrequent, is that the amount of water available at each milking is limited by the capacity of the cylinder. For this reason some users provide a copper as a standby.

Standard Schedule

In order to ensure sandard and efficient units being installed the Dairy Division, in collaboration with the Electrical Power Boards' Engineers' Association, drew up a schedule of cylinders and elements which must be installed in dairies. Briefly, these specifications are as follow:—

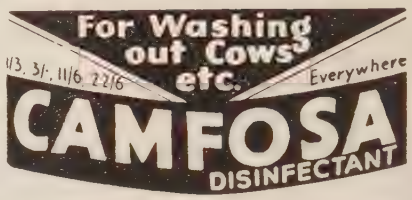
For a **Cream** Supply Dairy.—2-cow plant, 20-gallon cylinder, 700 watt element; 3 and 4-cow plant, 25-gallon cylinder, 900 watt element; 5 and 6-cow plant, 30-gallon cylinder, 1200 watt element.

For a **Milk** Supply.—2-cow plant, 20-gallon cylinder, 600 watt element; 3 and 4-cow plant, 25-gallon cylinder, 900 watt element; 5 and 6-cow plant, 40-gallon cylinder, 1400 watt element.

The particulars just given are for an electric supply which it cut off during milking. Where the supply is continuous, the elements are slightly smaller. It should be emphasised, however, that the capacity of the cylinder does not indicate the quantity of water actually available for use. Sufficient to cover the element always remains in the cylinder.

It is probably unnecessary to say that we are speaking entirely of hot water supply for the sole purpose of cleaning milking equipment. The provision of hot water for such things as baths, the scalding of pigs, the mixing of food for stock, and so on, is a different matter.

There is no objection to an electric heater or motor being erected in the releaser room, so that it is unnecessary to provide an engine-room where electricity is the motive power, but no engine or water heater of any other type is allowed in this room.



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Improvement of Hill Country Pasture

Outstanding Results from Grazing Management

Fig. 1.—A comparison between an "improved" paddock on the right, and on the left a paddock on which Mr. Hudson has not been able to carry out his spelling and rotational grazing methods.

Fig. 2.—A general view of the country on Mr. Hudson's farm.

[*N. Lamont, photos.*

N. LAMONT, Instructor in Agriculture, Masterton.

ALTHOUGH perhaps not based upon extensive or detailed investigation, the opinion is widely held that the amount of ryegrass present in a hill country sward is an index of the degree of response that can be expected from improvement measures. It is generally accepted that the presence of this grass, which is relatively highly responsive to topdressing is a fair indication that topdressing, probably with the assistance of subterranean clover, will pay, whereas, if the sward is composed almost entirely of "native" species, immediately profitable returns from phosphate dressings are not always to be expected.

In the latter cases it is presumed that at least for the first two or three years the function of topdressing is to build up the sward to a point where further dressings can give profitable responses—this point being indicated by the increased proportion of ryegrass and clovers in the sward.

Grazing management is one of the essential factors in the improvement of hill country pasture. This is emphasised by the author, who cites the outstanding results achieved by a Wairarapa farmer working on certain principles.

Ryegrass as Indicator

These remarks briefly summarise the general attitude towards hill country improvement, and while it is no doubt largely correct on the surface, it involves in practice an assumption which is not so acceptable. This assumption is that the presence or absence of ryegrass, which determines whether topdressing is profitable, is simply a reflection of the basic fertility of the country.

Although soil fertility is, of course, a factor, it is far from being the sole determinant of the type of pasture that will be found, and an increasing amount of evidence is accumulating to show that grazing management is infinitely more important so far as second or third-class hill country is concerned. On good rich country ryegrass swards are to be found in spite of bad grazing technique, but as fertility drops, so management increases in the importance of the part it plays in determining the species composition of the sward.

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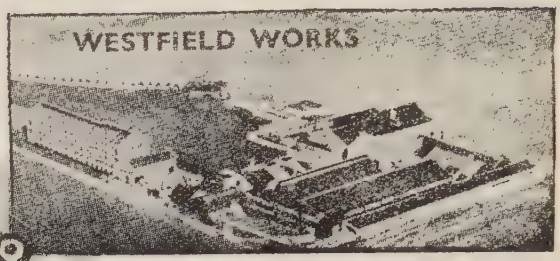

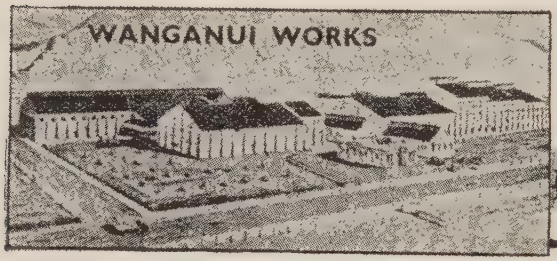

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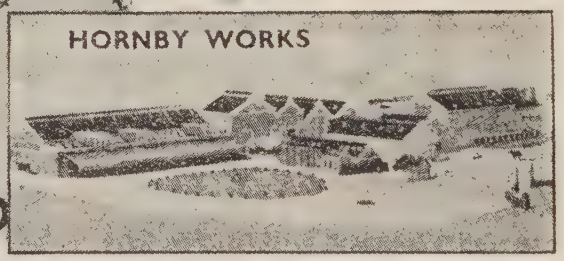

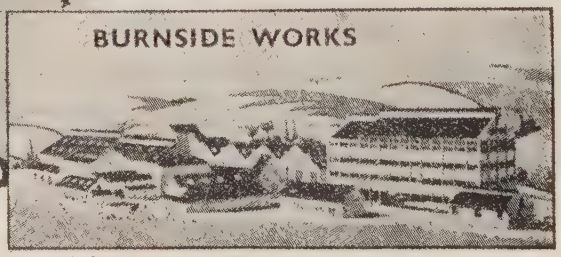

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In other words, grazing management and fertility are largely complementary factors and a deficiency in the one may be compensated for by excellence in the other.

Utilisation More Important Than Production

If it is agreed that the presence of ryegrass in hill country swards can be regarded as an index of managerial efficiency rather than solely of fertility level, a further submission can be made, namely, that it also indicates the existence of a level of managerial skill that will ensure maximum utilisation of any response that may be obtained from topdressing. There is no question that much of the conflict of opinion as to whether hill country topdressing pays arises from failure to utilise completely a potentially profitable increase in pasture production.

In a previous article the principles of grazing management were discussed, and it can be readily understood that profitable topdressing is not to be expected if practised in conjunction with a system of grazing that penalises those elements in the sward which are the most productive and the most responsive to topdressing, because they are also the earliest and the most palatable.

Position Summarised

The position may be summarised in the following advice to any East Coast hill country farmer who is interested in the improvement of his grassland.

(1.) Stop worrying about the labour and expense of topdressing and wondering whether the returns will compensate.

(2.) Evolve a system of spelling which will strengthen the proportion of English grasses (principally, if not entirely, ryegrass), which are almost certainly present, even if extremely sparse, in the sward.

(3.) Evolve a system of intermittent grazing (see previous article in the July issue of the "Journal") which will maintain the regenerated sward and which will, incidentally, ensure maximum response and efficient utilisation of that response in the event of the adoption of a programme of topdressing plus subterranean clover sowing.

(4.) Remember that improvement by means of grazing technique can in most cases be carried out for absolutely

Fig. 3.—These three photographs illustrate the comparative ease of handling large mobs on this country once they are accustomed to shifting. The photograph (*a*) was taken from just inside one gate of the 100-acre paddock, but the mob is already moving towards the other gate. In (*b*) the mob is practically mustered, although neither dogs nor horses were any closer than the spot from which the photograph was taken. Showing the mob of 2000 sheep about to pass out through the gate, (*c*) was taken just under 20 minutes after (*a*). [*N. Lamont, photos.*

no cost, although, to be thorough, more fences may be required at a later stage.

Practical Example

In the previous article, to which reference has already been made, and so far in this article attention has been confined to the theoretical principles of pasture management. There has been a tendency (fortunately less in evidence now than some years ago) to scorn "theory" and "science" as unworthy of a practical farmer, but it is becoming more and more obvious that the man who succeeds in difficult circumstances is **not** the "rule of thumb" farmer, but the one who, through a thorough understanding of the theory of his work, is able to adapt his practices to exploit the infinite variation of Nature to the fullest possible extent.

Such a man is Mr. John Hudson, of Waimimi, situated on the coast to the east of Masterton, and the results of his methods are so striking as to warrant very careful study—not so much with the idea of slavishly imitating them as with the object of appreciating the principles involved, so that they can be applied to other properties with probably different individual circumstances.

Farmer's Experience

Rather less than 30 years ago Mr. Hudson took up 3300 acres of hill country situated just south of Castlepoint. The area was in rather better condition than some of the neighbouring properties, having been the hogget country of the original large station, and no doubt the special management given it on this account enabled Mr. Hudson to get a flying start. On the other hand it is badly watered, the small available area of flat is wet and inaccessible, and generally the property is typical of a vast area of east-coast hill country of the sandstone and mudstone (or papa) type.

In 1910 the property carried about 4000 sheep and 250 cattle. It was poorly subdivided, and the pastures were of the usual open danthonia type, with a sparse sprinking of ryegrass. Improvement measures were immediately initiated, and in conjunction with an intermittent grazing scheme the carrying capacity was raised to 6000 sheep in a very few years. Following a decline during Mr. Hudson's absence in the war period, steady improvement has been made, until last year about 8000 sheep and 700 cattle were wintered.

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Spelling Technique

Although Mr. Hudson's methods present many unusual and interesting features, the most important for present purposes is the grazing and spelling technique he employed which doubled his carrying capacity and changed the species composition of his pastures from dominant danthonia to dominant ryegrass without any top-dressing or sowing of ryegrass seed.

The method was based on the principle discussed in the previous article, whereby a pasture species is encouraged by removing all stock at the period when that species is making its "dominant" growth—in other words, when it is growing more than any other species. For ryegrass, this period is the early spring, and it was at this time of the year that Mr. Hudson completely spelled portions of his farm in turn.

The amount spelled each year depended on the season and on the amount of feed available, but was generally about one-fifth of the farm, so that the whole was treated once every five years. The actual date of closing, although usually about the end of September, was fixed by the time when the ryegrass was observed to be making its first growth.

Essence of Method

This is, of course, the essence of the whole method. Instead of punishing the early palatable growth of ryegrass with hungry stock Mr. Hudson gave this species every opportunity to grow at a time when competition from later "native" species was at a minimum.

From early spring, therefore, the spelled area was not stocked right through the summer. With its advantage of earliness, the ryegrass strengthened its position in the sward, developed its root system and seeded freely, and today one will find few comparable hill country properties which can equal Mr. Hudson's so far as pasture quality is concerned. During the late summer and autumn the spelled area is cleaned up with cattle and allowed to freshen into excellent fresh growth for lambing ewes.

Fig. 4.—A closer view of the ewe flock.

[*N. Lamont, photo.*

This spelling process was continued for approximately 15 years, but it is not possible to say how long similar methods would need to be applied generally in view of the upset caused by the war period. It is sufficient to say that by 1926 Mr. Hudson found that his pastures were becoming too rich for the type of sheep he was running (practically all Corriedales), and he actually took steps to reduce the amount of ryegrass.

He readily accomplished this by burning, but found that this method was altogether too drastic in its destruction of the ryegrass, and has for the past twelve years maintained a desirable mixed pasture of ryegrass, dogstail, danthonia, sweet vernal, browntop, etc., simply by variations in his grazing technique.

Subdivision

The subdivision of the farm has been steadily improved since taking over, until now the majority of the paddocks are between 100 and 150 acres. Fencing has followed a definite scheme, and, as far as possible, similar types of country have been kept in separate paddocks. For instance, poorer slopes are not included with better gullies or flat tops, if at all possible, in order that such areas may be grazed according to their special requirements.

There is, of course, no question that adequate subdivision is essential before the thoroughly efficient application of intermittent grazing principles is possible, but, at the same time, very considerable improvement can be expected without the heavy expense of fencing. It is simply a matter of management with due reference to

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the possible limitations imposed by individual circumstances.

Stock

Some mention must be made of the stock carried by Mr. Hudson, as they undoubtedly have some bearing on the management methods he has employed. His flock is practically all Corriedale, although not built up from stud Corriedales as such, but maintained by the use of 10 per cent. of merino rams as well as halfbred rams of his own breeding. All wethers are kept and fattened as 6-tooths, and ewes are not bred from until 4-tooths, so that he has at his disposal a large mob of dry sheep which can, if necessary, be punished in the interests of pasture management more than is possible with breeding ewes.

Although prices have not been so favourable over the past two or three years, the fine wool produced commanded a premium, while an average of at least 9lb per fleece is obtained over the whole flock. Except in recent wet seasons, none of the foot trouble usually associated with merino blood has been experienced, while 90 per cent. of lambs at docking, calculated on ewes actually turned out with the rams, is very satisfactory.

Present Grazing Methods

As previously mentioned, Mr. Hudson has not used his spelling technique for about twelve years. It was, in fact, merely a special device to increase the ryegrass content of his pastures rapidly and he now finds that this can be maintained and, if desired, increased by an intermittent grazing programme. Briefly, his procedure is to maintain his sheep in three mobs, which are shifted regularly around the farm at a rate depending on feed conditions, but generally each paddock is grazed for about ten days, following which there is a resting period of three weeks to a month—or less in periods of rapid growth.

The impossibility of laying down precise rules for this type of country has already been stressed, and only a thorough understanding of the principles involved can ensure success. It is, however, significant that the best hill country graziers stress this point—the shorter the feed the longer the spell, and vice versa.

Use of Cattle

The use of cattle on hill country is a subject which receives a good deal of attention, and rightly so, where secondary growth is a problem. On the drier East Coast country, however, cattle need be used solely to clean up roughage, and to do so thoroughly they should be concentrated in one mob while working in this manner.

It is, however, of interest and of considerable significance to note that Mr. Hudson rarely finds it necessary

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to concentrate his cattle. The frequent shifting of his sheep results in **even** grazing, with a relative absence of the common mixture of overgrazed and neglected patches. Certain paddocks may, of course, be withdrawn from the rotation in the spring, and these will later require "cattling," but the greater part of the farm is always kept in good order by the frequent shifting.

A point worthy of note in this connection is one frequently illustrated on hill country where cattle only have been grazed on a particular paddock for some years and a dominant ryegrass sward is found, while over the fence little or none is present. Such examples are well known, but what is less appreciated is the fact that this effect of cattle grazing can be very closely imitated with sheep provided they are frequently shifted and are made to graze **evenly** and not too closely.

This point is clearly illustrated on Mr. Hudson's property, and is one that should be borne in mind by those who fear that hill country deterioration can be arrested only by reducing the number of their sheep in favour of an increase in cattle numbers.

Conclusion

It is hoped that this account of Mr. Hudson's farm and methods will be of interest and value to other hill country graziers, as he has undoubtedly demonstrated in no uncertain manner that weak danthonia swards can be regenerated and improved by means of costless grazing methods. Any consideration of topdressing as a further improvement measure could and, indeed, should be postponed until these methods have been tried. When, as we can confidently expect, improvement has been initiated and, in some cases, when sufficient subdivision has been done, then may topdressing be embarked upon with every expectation of receiving a response, and the utilisation of that response that will ensure profitable returns.

The outstanding management features in so far as Mr. Hudson's property is concerned can be stated briefly as follows:—

(1) Throughout the thirty years, the firing of grass roughage has been banned except when burning was used in later years to reduce the proportion of ryegrass. Cattle and sheep have handled all grass roughage.

(2) Systematic early spelling of blocks of country to give the earlier English grasses a chance, followed by "cattling" the roughage in late summer and early autumn, was the initial step in improvement.

(3) Systematic spelling and quick grazing-off by as large mobs as possible of both sheep and cattle moved continually round the farm was the basis of further improvement. Such grazing gave every advantage to the quick-recovering grasses, and least encouragement to the inferior grasses, and no encouragement to tea-tree and bracken fern because the sward was kept dense and thriving.

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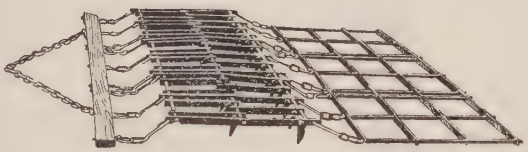

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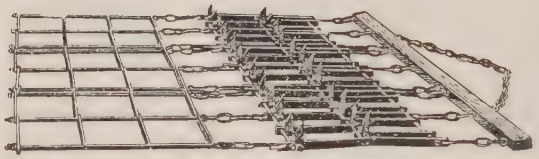

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C. R. TAYLOR, Fields Instructor, Whakatane.

ALTHOUGH the general practice of regular and efficient pasture harrowing for the principal purpose of distributing animal droppings as they accumulate is important, it is especially necessary that this essential work be undertaken in a thorough manner in fields which are mainly used during the winter months for the feeding out of hay and ensilage to stock. Neglect in this direction not only involves much waste of valuable "stock" nitrogen, but also results in an intensely patchy sward in the spring, and much of the growth is not relished by stock because of its rankness and consequent lack of palatability.

Thus, at a period when feed is naturally scarce and the early calves require the very best attention that can be given to them, it is obviously not a wise plan to have fields in such a state that less than half the herbage produced by quite good pastures is insufficiently appetising to maintain these animals in the thriving condition that is so necessary at this stage to both man and beast. The photographs accompanying this article clearly illustrate the point the writer wishes to make.

Value of Nitrogen

Nitrogen ranks as one of the important and essential plant foods, and without it the economic plants could not survive, for it is this element that is mainly responsible for the vegetative growth of plants, that is, formation of leaf, stem, and roots. A plentiful supply of available nitrogen, provided that all other necessary elements are also present in the soil in an available form, is indicated by good growth and a deep green colour; a low nitrogen level results in stunted growth which is a sickly yellow-green in appearance.

Inefficient harrowing—or none at all—results in the waste of much free fertiliser. Animal droppings contain an appreciable amount of nitrogen, which is one of the most essential plant foods, and if these are harrowed in thoroughly before they become too hard an even growth of vigorous, palatable herbage will result.

Fig. 2.

It is very largely due to the realisation of the importance of nitrogen that every endeavour is made to secure adequate clover representation in permanent pastures, for the clovers are equipped by Nature with means of storing nitrogen in their root nodules per medium of the nitrifying bacteria present in most soils. This nitrogen, which is always available to other pasture species living in close association with the clovers, results in good, healthy grass growth, high carrying capacity, and satisfactory animal performance.

During the winter months, however, with their attendant low soil temperatures, the nitrifying bacteria are least active, and in some districts entirely inactive. Thus, for a time the manufacture of suitable nitrogen compounds almost ceases, resulting in a condition of temporary nitrogen starvation or, what is more apparent to the farmer, lack of growth.

Use of Droppings.

Animal droppings contain an appreciable amount of nitrogen suitable for assimilation by plants, and it is for this reason that the proper harrowing of pastures is so incessantly advocated by agricultural authorities. If harrowing is not undertaken just when required the droppings become too hard to be spread efficiently at a later date. They tend to kill out the patches of pasture over which they lie, and most of the vital nitrogen is wasted in that only relatively small areas of pasture benefit from it.

Fig. 3.

I deliberately use the word "wasted," because the patches that apparently benefit produce such a luxuriant growth of rank, unpalatable feed that stock have literally to be forced to eat it, and force, particularly applied to milch cows, spells waste. It is far better to distribute this valuable source of nitrogen thoroughly and allow the whole pasture to benefit.

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Inefficient Harrowing

Fig. 1 shows the result of inefficient pasture harrowing. An enormous waste takes place when farm management fails to take advantage of the valuable plant food contained in animal droppings. It has been estimated that a mature cattle beast will void up to 12 tons of manure each year. Therefore, reckoning on one beast to two acres, there are six tons available per acre each year.

Fig. 2 shows a further result of inefficient pasture harrowing after stock had been fed out hay in the field. Note the rank, luxuriant growth produced by excessive nitrogen and the poor, nitrogen-lacking growth between the dark green patches. The proper distribution of manure would have brought about an even growth of vigorous herbage over the entire field without prejudicing the palatability.

Fig. 4.

Fig. 3 shows a pasture which has received a fair measure of harrowing, but insufficient to make a really first-class job. Actually, harrowing was left too late, and the droppings had become a little too firm to permit of even distribution. Nevertheless, it is a great improvement on the conditions shown in Figs. 1 and 2.

Fig. 5.

The paddock in Fig 4. has just been thoroughly harrowed and the stock droppings well distributed as a result.

Fig. 5 shows a paddock in need of harrowing, although not yet in a really bad condition. If left, however, the appearance on this field in the spring will be similar to those depicted in Figs. 1 and 2.

It is a trait of human nature that what comes too easily is not valued. Earn a sum of money as the reward of a week's hard toil and, generally speaking, every penny of it has a very real value. On the other hand, come by a similar sum of money, say at the races, and not infrequently a very different conception of value is at once evident.

Similarly, when fertilisers are purchased the utmost return is expected for the expenditure; otherwise, keen disappointment is the result. If, however, an abundant supply of a valuable plant food is provided for by Nature what is the result?—In a large measure, simply indifference to the gift.

Today, as never before in the history of farming throughout the world, "every post must be made a winning post" if the gap between costs and prices is not to become overpowering, and every advantage offered from time to time must be fully exploited to this end.

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Fig. 1.—The fourth harvest of the season's lucerne crop on Mr. E. D. White's farm, Putaruru.

Yields from Lucerne Crops

Usefulness in Rotorua and Putaruru Districts During Dry Spell

C. S. DALGLIESH, Field Instructor, Rotorua.

THE Rotorua and Putaruru districts are fortunate in that they have a good average annual rainfall of more than 50 inches, and, what is most important, this rainfall is fairly evenly distributed throughout the year. Although dry spells are experienced, it is rare that they are prolonged. Both districts, therefore, are admirably suited for pasture growth.

Thus, the growing of lucerne is not so necessary as in districts with a low average rainfall, but at the same time it is a crop that has a very useful place in farming practice in these districts, and its usefulness was clearly demonstrated during the autumn dry period, when very little rain fell after January.

In the Putaruru district the oldest stands of lucerne are about 12 years old, but successful crops were grown earlier than that. In Rotorua the oldest stands are from eight to 10 years old. With an annual average rainfall of more than 50 inches and at times more than 60 inches, white clover and *Poa annua* grass become very troublesome, forming a close sward which is detrimental to free progress and the life of the lucerne.

Although the growing of lucerne is not so necessary in the Rotorua-Putaruru districts as in districts with a low average rainfall, it is a crop that has a very useful place in farming practice in those areas. Its usefulness was clearly demonstrated during the autumn dry period, when very little rain fell after January.

Time of Sowing

In the establishment of lucerne many farmers plough up an old pasture and then sow a root crop with the object of improving conditions for successful establishment. Others omit the root crop, and sow following the ploughing and cultivation of the old pasture land. The latter method produces by far the better stand of lucerne, being more free from weed growth and more vigorous in early establishment. Lucerne following root crops or rotation crops generally makes poor headway for the first two years and weed growth gives much trouble, but it makes surprisingly good development after this.

Inoculation of the seed with the nodule bacteria is most important if first-class results are to be obtained. This can be procured from the Plant Diseases Division or by applying directly to the local office of the Department of Agriculture.

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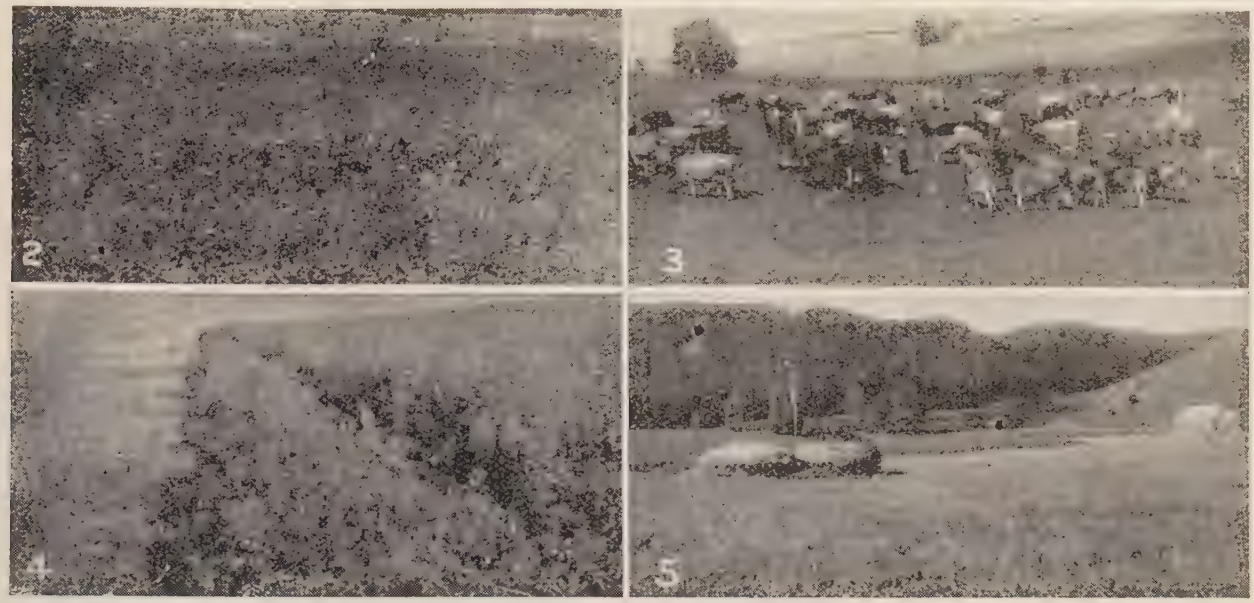

Fig. 2.—Spring-sown lucerne (1938) on virgin pumice soil. Weak in parts, but good in other parts. *Fig. 3.*—Feeding lucerne to the dairy herd on Mr. E. D. White's Farm, Putaruru. *Fig. 4.*—A good five-year-old stand of lucerne in the Rotorua district. *Fig. 5.*—A six-acre field of lucerne in Mr. C. G. Penwarden's farm, Lichfield Road, Putaruru, which provides winter and supplementary green feed for the dairy herd.

Lucerne is occasionally sown on virgin pumice soils following the first ploughing. Establishment is not vigorous, and for the first and second years the crop does not appear promising, but it then generally develops into fair crops, the root system having by this time become vigorous. Fig. 2 shows a 1938 spring-sown crop on light virgin pumice soil, good in parts, but weak in other parts.

Fertilisers

The management and fertilising of the established crop varies on different farms. Common topdressings are:—Superphosphate 3cwt. and lime 3cwt., or superphosphate 3cwt. and lime 2cwt. per acre per annum. Occasionally, two dressings may be given, and the system of lighter applications after the harvesting of each crop is also adopted. The minimum production is three harvested crops and one light grazing per annum, although this is exceeded on many farms.

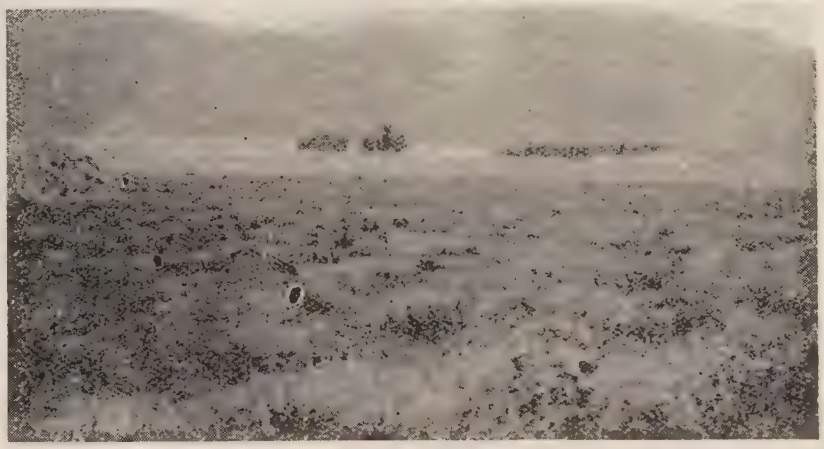

Fig. 6.—Persistent lucerne on light pumice soil, sown following first ploughing, showing re-establishment of lucerne after a swede crop; patchy but strong growing.

Fig. 7.—As for Fig. 6, but excellent re-establishment of lucerne after being ploughed and sown in swedes.

Lucerne, like all other plants, responds according to soil conditions and treatment, both in establishment and subsequent production.

Fig. 1 shows the harvesting of the fourth crop of lucerne this season in Putaruru district. Part of this crop was sown following swedes, which

made poor headway for the first two years. Weeds gave considerable trouble, in addition to the lack of vigour of the lucerne. The major portion of the field was sown direct following the ploughing and cultivation of lea land, and made good headway right from the start. The swede area is now a successful stand.

Prolific Crops

This lucerne area was lightly grazed in the autumn of 1938 following four prolific crops, which were fertilised with superphosphate and lime in equal parts at the rate of 4cwt. per acre and spelled throughout the winter. The first crop for this season was harvested on October 31, the second on December 12, and the third on January 23. All the crops were made into ensilage. The third crop was the best of the season, averaging one foot more growth than the present crop, the fourth.

The harvesting of this fourth crop was begun on March 6. Approximately half an acre was harvested daily and fed to the dairy herd of 90 cows in milk and 10 head of dry stock. The milk yield, in spite of the dry period, is very satisfactory, and, in addition to the maintaining of a satisfactory milk yield, the feeding of lucerne has allowed a fair area of pasture to be spelled.

A topdressing of 1½cwt. of superphosphate and 1½cwt. of lime has been applied after the harvesting of each crop. Fig. 3 shows the dairy herd of 90 cows, which are in excellent condition, being fed with lucerne. The area of the farm is 110 acres.

Rotorua District

In the Rotorua district lucerne establishment is not so far advanced as in Putaruru, but it does quite well. Fig. 4 shows the third harvest of the year of a five-year-old stand. Recent inquiries as to methods of sowing and treatment indicate that lucerne growing will receive more attention in the near future.

Fig. 5 shows a three-year-old lucerne stand in the Lichfield district, part of which was harvested and utilised for feeding to dairy stock during the dry spell. This is the fourth crop of the year of four weeks' growth of an average height of 2ft. 3in. of good, dense, succulent lucerne.

The first crop was harvested in mid-November, and supplementary feeding of the fourth crop began at the beginning of the second week of March. The milk yield of the dairy herd of 70 cows on this farm is maintaining a very satisfactory level, and there was no more than the usual seasonal drop during the month. The manurial treatment of this lucerne stand is 3cwt. super and 2cwt. of lime per acre twice a year.

Handling of Crop

Lucerne is regarded by many as being a delicate crop requiring careful handling, but this greatly depends on soil conditions, and where soil conditions are to its liking it becomes a persistent plant. On the light soils of Galatea Estate in the spring of 1932 a total of 10 acres was sown down in lucerne following the first ploughing of the virgin soil. Establishment was irregular and slow, and lucerne-growing under such conditions appeared to be a very doubtful proposition. Although grass has taken charge of the weaker patches, this area has provided

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excellent crops of strong-growing lucerne.

In the winter of 1934 three acres were ploughed, and cultivated in the spring and summer and sown in swedes, providing a very good crop, with quite an amount of strong-growing lucerne among the swedes. This area has not since been ploughed, and has each year provided useful crops of lucerne. It is undoubtedly patchy in parts, as shown in Fig. 6, but it is excellent in parts, as is shown in Fig. 7.

Lucerne does exceedingly well on Galatea soils, and is a crop that must play a great part in the successful farming of this district. The growth is more rapid than in the Rotorua-Putaruru area, and during the flush of the growing season crops are ready to harvest in four to five weeks' time.

It has been consistently advised not to graze lucerne, but under careful husbandry grazing has not proved detrimental. Many farmers agree that judicious grazing will improve the lucerne, and all are definite in agreement that excellent stands of lucerne can be ruined by injudicious grazing, a factor which has been clearly demonstrated in the district.

Practical Example

The Overdale district is undulating to high ridges, and lucerne thrives in this area. Mr. A. T. Morriss has a four-year-old stand of lucerne which, last year, was not up to his previous experience of lucerne production on his farm. Three crops were harvested for hay and silage, and then the area of 11 acres was grazed with 150 ewes from March 31 to May 1, when the ewes were removed and 130 two-year-old bullocks were put on to graze. These bullocks were grazed on the 11 acres from this period to the second week of September, receiving lucerne hay and silage as supplementary winter and spring feed.

Three crops have been harvested this season. The first was harvested in the third week of November and made into ensilage. The next two crops were made into hay, and the harvesting of the third crop was done in the first week of March. Mr. Morriss is well satisfied with the results of his grazing treatment, and states that the field of lucerne has definitely improved. His manurial treatment is 3cwt. superphosphate and 3cwt. of lime per acre each year, with occasional extra applications.

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Hop Marketing Regulations

Committee Appointed to Regulate Marketing Policy

A. E. MORRISON, Solicitor, Department of Agriculture.

BY the Hop Marketing Regulations, 1939, which came into force on July 28, and which are enacted under the Primary Products Marketing Act, 1936, and the Agriculture (Emergency Powers) Act, 1934, a Hop Marketing Committee is established. The functions of the committee are to regulate and control in such manner as it thinks fit, but subject to the prior approval of the Minister of Marketing in all matters of marketing policy, the marketing of hops in New Zealand and overseas. The committee may, among other things, but subject to the approval of the Minister, deal with the handling, pooling, and storage of hops, the export of hops, the insurance against loss of hops in New Zealand or in transit from New Zealand, and the sale and disposal of hops on such terms as it thinks advisable.

Personnel

The committee consists of six persons, namely, one Government representative and five producers' representatives appointed by the Minister upon election in manner provided in the schedule to the regulations. A producers' representative holds office for one year or until his successor is appointed and comes into office, and may, if re-elected, be appointed for a further period of office. The first producer members of the committee are to continue to hold office until September 30, 1939.

Casual vacancies on the committee which arise on the happening of any one of a series of specified events are to be filled by appointment by the Minister of some fit person in lieu of the member vacating office for the residue of the latter's term. In the case of a casual vacancy in the office of a producers' representative the appointment is made on the recommendation of the committee.

The regulations provide that the first meeting of the committee shall be held at a time and place appointed and notified by the Minister, and the Minister may at any time exercise this power in respect of committee meetings other than the first. The regulations deal with the appointment of a chairman of the committee, the number of members who form a quorum at committee meetings, and the grounds on which proceedings of the committee are not to be invalidated.

Subject to the provisions of the regulations, the committee may make its own arrangements for holding committee meetings, the procedure of meetings, and generally for the conduct of its business and the exercise of its functions.

Agent of Producer

No producer shall sell and no person shall purchase from a producer any hops except through the agency of the committee, which is deemed to be the agent of every producer in respect of the marketing of hops, and the rights and liabilities of the committee and producers are determined according to the law governing the relations between principal and agent.

Not later than August 31 in each year the committee must furnish the Minister with a report and a duly audited statement of accounts showing fully the financial results of its operations for the year ended July 31 immediately preceding.

Copies of the regulations may be obtained on application to the Government Printer, Wellington, price 6d., plus 1d.

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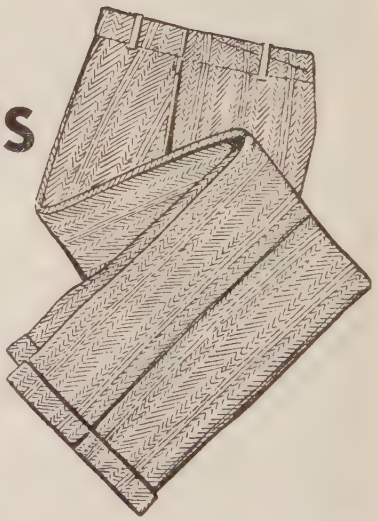

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Continued Increase In Output Of Chief Dairy Products

Imperial Economic Committee's Annual Review Of Production and Trade

THE annual review of production and trade in dairy-produce, recently issued by the Imperial Economic Committee,* notes a continued increase in the output of the chief dairy products and the maintenance of international trade in butter at the high level attained during the past two or three years. International trade in cheese has been declining for several years, although this tendency was checked to some extent during 1937, while trade in eggs, which had recovered in 1936 from a downward trend lasting for some years, has since increased further.

Butter Consumption

The increase in world butter production and trade during a number of years has been accompanied by a remarkable expansion of consumption in the United Kingdom, but more recently, with an increase in butter-prices and in the consumption of margarine, this trend appears to have been reversed. There has not been, however, either in the United Kingdom or in Empire countries overseas, any marked reduction in the total consumed, while in Germany the past two or three years have witnessed a pronounced increase.

There still remain large differences as between different countries in the level of consumption. This is highest in the overseas Dominions, where an annual figure of from 30lb to 40lb per head is usual; but in the chief consuming countries of Continental Europe and in the United States the comparable figures are more commonly from 12lb to 20lb per head. In the United Kingdom *per caput* consumption has recently averaged about 25lb per annum.

International Trade

Until very lately the growing world exports of butter were directed towards the United Kingdom market, but Germany has for some years now been taking increasing quantities, and there has been among the smaller European importing countries some relaxation of the restrictions on imports which were imposed during the crisis years. The United Kingdom, however, remains by far the most important market and still takes about four-fifths of the total butter entering world trade. Approximately one-half of the United Kingdom's imports come from Empire countries.

The United Kingdom is also the most important market for cheese, although to a much smaller extent than for butter, as Germany, Belgium, France, and the United States all import considerable quantities. In contrast to butter, international trade in cheese has tended to decline in recent years, and exports from New Zealand, the Netherlands, and Canada are now much smaller than a few years ago. There was, however, during 1937 a check to this decline.

The United Kingdom's imports, 90 per cent. of which are from Empire sources, have moved, on the whole, within fairly narrow limits during the

* "Dairy produce": A summary of figures of production and trade relating to butter cheese, preserved milk, casein, eggs, and egg products. Published by H.M. Stationery Office for the Imperial Economic Committee. 2s. 6d. net; post free, 2s. 8d.

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past seven or eight years, declining until 1936 but thereafter recovering. The consumption of cheese has in many cases tended to increase, the United Kingdom, with an annual figure of from 8lb to 9lb per head, being the only important consumer to show a persistent reduction in recent years.

The level of consumption in European countries is considerably higher than in Empire countries, occasionally being as much as 15lb to 20lb per head, and in general appears to have advanced during the past few years.

Import of Eggs

International trade in eggs was declining up to 1935, but has since recovered, and an expansion in shipments from most of the exporting countries of Northern Europe has more than offset a decline in those from the Southern Hemisphere. The United Kingdom has taken the bulk of these heavier exports, but Germany also in the past two or three years has imported increasing quantities. The former country accounted for very nearly half the total world exports in 1937, and the latter for nearly one-quarter. A survey of the available figures seems to indicate that in several countries, including the United Kingdom, Canada, and Eire, a decline in consumption has been recorded in the past few years.

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Dairy-produce Prices

Prices for dairy-produce and eggs have to a large extent recovered from the low levels to which they had fallen during the depression. By 1937 butter-prices on the United Kingdom market were little lower, on average, than in 1931, while those for cheese showed an even more marked recovery, prices in 1937 almost attaining the 1930 level. The fall in prices was not so severe for eggs as for milk products, and, although quotations for home-produced eggs were by 1937 almost as high as six years earlier, those for imported eggs showed a much smaller recovery.

The upward movement in butter-prices continued during the greater part of 1938, although from the middle of the year the margin over the corresponding 1937 quotations was narrowing, and in the late autumn quotations fell below the previous year's level. A somewhat similar trend was recorded for cheese and egg prices, which also during 1938 exceeded, on average, the corresponding figures for 1937, although towards the end of the year they were below the comparable figures for the preceding year.

Milk Products

The review includes a survey of production and trade in processed milk and casein. The output of the former commodity expanded considerably in the United Kingdom after 1933 and in 1937 was more than three times as great as in the earlier year. The total manufactured in the United States—by far the largest producer—and in the Netherlands has also increased considerably.

The United Kingdom remains the largest importer of processed milk, although the quantities now taken are very much smaller than a few years ago. The trade in casein has been fairly well maintained. Argentina and France remain the chief exporters of this product, which is marketed chiefly in the United Kingdom and Germany.

During the early spring a considerable quantity of Cape barley was sown in the vicinity of Pakowhai, Hawke's Bay, on a lot of silted land. This barley has done very well and many of the harvests have been in the vicinity of 60 to 70 bushels per acre.

Brown Spotting Of Apricots

Experiments Reveal Boron Deficiency

H. O. ASKEW, Cawthron Institute, Nelson, and
W. R. LLOYD WILLIAMS, Instructor in Horticulture, Alexandra.

IN CERTAIN orchards at Alexandra, Central Otago, boron deficiency of apples has been definitely established as a result of the co-operative investigations of the Department of Agriculture and the Cawthron Institute.† The success obtained with borax in the control of internal cork suggested the possibility that defects in certain stone fruits grown in the same locality might likewise be due to boron deficiency.

A browning of the flesh of apricots, more particularly in the stem end of the fruit, has been shown to be due to boron deficiency. This ailment may be controlled by the use of hydrated borax, either as a soil topdressing or as a spray. The marked increase in boron content of the fruit following borax treatment is correlated positively with freedom from browning of the flesh.

Apricots on certain light-textured schist soils on the banks of the Clutha River develop a brown spotting of the flesh which superficially resembles lesions caused by boron deficiency in apples. Interest attaches to this ailment as McLarty and Wilcox have stated that a disease "drought spot" of apricots in British Columbia is amenable to boron therapy.* The authors are however unaware of any published description of the symptoms of the Canadian disease.

Arrangements were made through the willing co-operation of Mr. G. S. Harvey for a field trial on a part of his orchard. The field work was done by officers of the Department of Agriculture, and the chemical analyses were carried out at the Cawthron Institute as part of the boron investigations which have been proceeding there during the past few years.

Symptoms of Disease

Affected fruits show a browning of the flesh, often definite lesions of several millimetres diameter. In mild cases only the stem end is effected, but in more severe cases this browning or spotting may extend almost the whole length of the fruit, being most obvious near the stone. A dry spongy condition of the flesh near the stone is also seen. "Brown spotting" appears to be a suitable name for this ailment. Whether it is identical with the "drought spot" of McLarty and Wilcox* is not known.

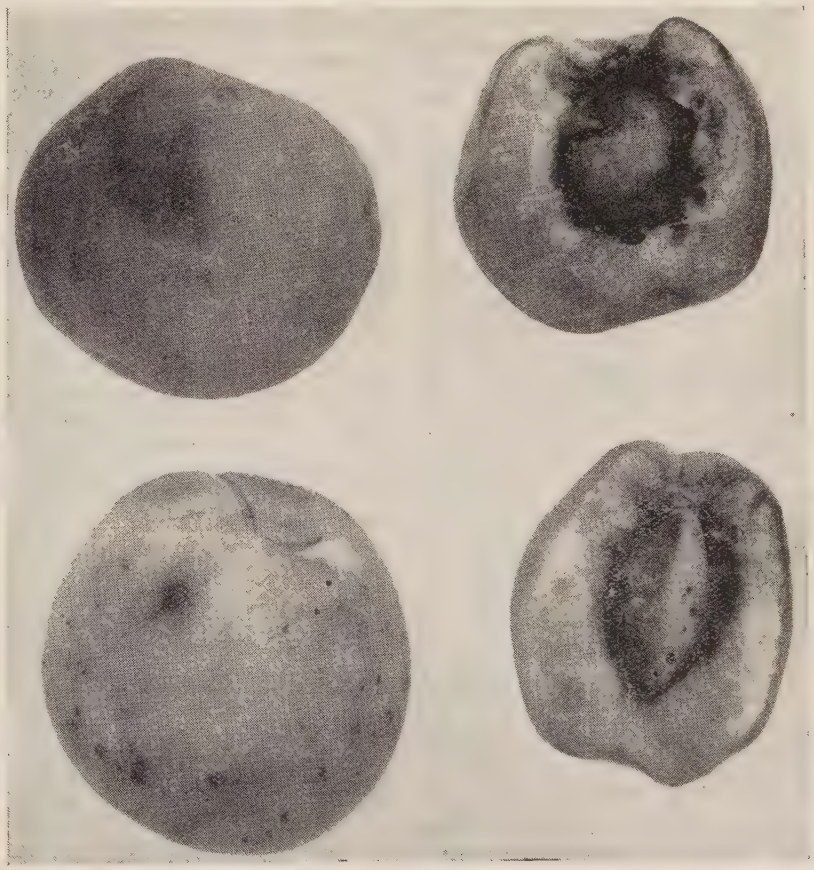
Fig. 1 shows affected and healthy fruits, the latter being in the top row. As the photograph shows a constriction in the flesh of the fruit often occurs near the stem end in seriously-affected fruits, which are valueless in the market.

Field Experiment

In the experiment the trees, variety Newcastle (an early variety), were arranged in plots of four trees. Three replications of each treatment were provided, with suitable guard rows between the plots.

Two treatments with hydrated borax were used:

(1) Spray 0.1 per cent.; applied on October 20 and November 10, 1938. For the twelve trees treated a total of 11½ gallons and 10½ gallons of spray were used on the respective dates. Both days were bright with a light breze.



Top row: Healthy fruit. *Bottom row:* Affected fruit. The affected fruit (uncut) appears better probably because it was more mature and thus shows up as a lighter colour. The sound fruit was quite green when photographed.

(2) Soil topdressing; ½lb per tree, applied on October 20, 1938. The borax was applied over a circle of radius about 5ft from the tree trunk and lightly hoed in.

(3) Control (untreated) plots were provided.

An inspection of the trees made by Mr. I. L. Nottage of the Department of Agriculture on November 10 showed no damage to foliage from the first spray. There was no sign of browning in the flesh of the fruit on this date.

On December 14 the owner reported that he had noticed brown spots on the flesh of the fruit about a week previously. The fruit was now advancing rapidly to picking maturity on the untreated trees, but was more backward on the treated trees. No affected fruit was found on the treated trees, but much badly-affected fruit was present on the untreated trees. Samples of leaves and fruit for chemical analysis were collected at this stage.

Untreated Trees Suffer

On December 21 fruit was commencing to drop badly on the untreated trees in the experimental block, and on other untreated trees in the body of the orchard. From the experimental blocks 100 fruits were collected from each unit of four trees except that on some of the untreated trees no fruit was available so that extra fruits were taken from those trees carrying fruit. These samples were used to obtain counts of healthy or affected fruits.

In the examination of the fruits three grades were used:—(a) Free from browning, (b) slightly affected, and (c) moderately to badly affected. Table 1 shows the results of these counts.

From the three control plots an average of only 2 per cent. of fruit free from spotting of the flesh was obtained. The remainder of the fruit was slightly to badly affected. On the other hand the fruits from the borax-treated plots were very free from ailment, 94 per cent. and 98 per cent. of clean fruit being obtained on the sprayed and topdressed plots respectively. In both these cases the affected fruit showed only slight blemish.

Weights of 100 fruits are also given in Table 1. The fruits from the control and borax-sprayed plots are comparable in weight, being 6lb 2oz and 6lb 8oz respectively for the number of fruits specified. These weights are in keeping with the stage of maturity, the control fruit being nearly mature with the sprayed fruit a few days behind. On the topdressed plots, however, the fruit was very markedly retarded, and therefore much smaller. The weight of 100 fruits from the topdressed plots was only 4lb 12oz.

TABLE 1.

Showing Percentages of Healthy and Affected Apricots together with Weights of 100 Fruits.

Treatment.	Plot.	Free from spotting per cent.	Slightly affected per cent.	Moderately to badly affected per cent.	Weight of 100 fruits.
Control (No borax)	A	4	62	34	5 lb. 14 oz.
	B	1	37	62	6 lb. 9 oz.
	C	1	56	43	6 lb. 0 oz.
	Average	2	52	46	6 lb. 2 oz.
0.1 per cent. borax spray	D	94	6	—	6 lb. 4 oz.
	E	95	5	—	6 lb. 15 oz.
	F	93	7	—	6 lb. 5 oz.
	Average	94	6	—	6 lb. 8 oz.
0.5 lb. borax topdressing	G	99	1	—	4 lb. 12 oz.
	H	100	—	—	4 lb. 8 oz.
	I	95	5	—	4 lb. 15 oz.
	Average	98	2	—	4 lb. 12 oz.

NOTE.—Slightly affected fruits were those showing browning in the flesh just below the stem but not sufficiently advanced to show throughout an appreciable part of the flesh.

Maturing of Fruit

An interesting observation made by Mr. Harvey during the harvesting was that although, as stated above, the fruit on borax-treated trees was less mature than that on the control trees when picking began, all the fruit on treated trees had matured and were harvested before the picking could be completed on the control trees. Thus the treated trees matured their fruit very rapidly. Mr. Harvey also considered that the fruit from the topdressed trees when harvested was slightly larger than that from the untreated or borax-sprayed trees.

Samples of leaves and fruit from the experimental blocks were analysed for boron content, the results being given in Table 2.

TABLE 2.

Boron Content, in Parts per Million (p.p.m.) on the Dry Basis of Apricot Leaves and Fruit.

Treatment.	Boron (B) p.p.m.	
	Leaves.	Fruit.
Control (no borax) ..	12.5	5.7
0.1 per cent. borax spray	32.0	34.5
0.5 lb. borax per tree: topdressed ..	40.5	46.5

The figures for the control show a very low boron content for both leaves and fruit, correlating well with corresponding data for internal cork of apples.† On the other hand fruit from the two series of borax-treated plots showed 34.5 p.p.m. and 46.5 p.p.m. on the dry basis.

These data indicate that the borax applications have been readily taken up by the trees and used in the production of healthy fruit, since, as shown in Table 1, clean fruit was obtained on the two series of borax-treated plots. A very good correlation is shown between boron content and healthiness of the fruit, high boron content being associated with freedom from browning of the flesh.

Observations on other varieties in this orchard showed that on December 21, Roxburgh Red and Ouillins were rather badly affected, but not so severely as Newcastle variety. Moorpark, the latest to mature of the varieties present in the orchard, appeared to be free of the complaint.

The results of the investigation therefore indicate that in orchards where the particular type of internal browning of the flesh of apricots occurs excellent control of the disease may be obtained either by the use of 0.5 pound of hydrated borax per tree as a topdressing or by the use of a 0.1 per cent. borax spray. The latter treatment would almost certainly require to be an annual one, while the former one application at the rate specified should last for several seasons. It is proposed to continue observations on this point in future seasons.

REFERENCES.
* McLarty, H. R., and Wilcox, J. C. (1936); Country Life in B.C., Vol. 20, Dec. P.7.
† Askew, H. O., and Thomson, R. H. K.; (1937), N.Z., J.Sci. & Tech., 18, 661.

Transplanting Silver Wattle

A CORRESPONDENT, O.S. (Gisborne) writes:—Would you kindly inform me per the "Journal" re the silver wattle *acacia dealbata*?

Does this transplant readily from open ground, or is it better to prick out the seedlings into trays in the autumn for spring planting? Is it a sufficiently vigorous grower to be safely planted among bracken fern, where the soil is open and of a fairly good quality? In planting in fern ground, would a little super be advisable at time of planting?

The Fields Division replies:—This plant, as with all the wattle family, is not easy to transplant, particularly from open ground, where the seedlings are likely to be too close together to allow for the removal of sufficient earth with the roots to protect them from drying out and loss of the nodules which form on them. If transplanting is necessary the seedlings should be pricked out into trays and each plant removed for transplanting to the permanent site with a good ball of earth.

This *acacia* is sufficiently hardy to be sown in the ground it is to occupy, and this is the usual practice in establishing hedges or shelter belts of the plant. The seed is sown and raked in on a prepared seed bed. It will also establish readily on bracken fern areas if sown in the spring on the fern, which is later burnt off. The heat serves to germinate the seed, and the seedlings will grow up through the fern. A little lime and super would assist the young acacia plants.

Slaughterings of Stock

THE following return of slaughterings of stock at meat-export slaughterhouses and abattoirs for the months of May, June and July, 1939, has been compiled by the Livestock Division:—

District	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Swine
North Island						
Meat-export Slaughterhouses—						
Auckland	65,042	102,144	24,132	13,888	62,722	37,249
Poverty Bay-Hawke's Bay	18,935	9,861	86,342	23,050	125,111	5,658
Taranaki-Manawatu	38,809	23,202	54,355	26,696	158,973	26,822
Wairarapa-Wellington	14,724	2,544	29,468	12,691	69,207	4,625
Totals	137,510	137,751	194,297	76,325	416,013	74,354
Abattoirs	32,359	9,963	120,270	62,087	11,676	22,561
North Island Totals	169,869	147,714	314,567	138,412	427,689	96,915
South Island						
Meat-export Slaughterhouses—						
Nelson-Marlborough	583	9	5,433	2,114	23,420	1,681
Canterbury	3,774	4,084	140,064	103,789	435,182	7,401
Otago-Southland	2,793	218	61,083	39,082	572,315	1,464
Totals	7,150	4,311	206,580	144,985	1,030,917	10,546
Abattoirs	15,498	3,322	74,933	38,750	7,612	8,112
South Island Totals	22,648	7,633	281,513	183,735	1,038,529	18,658
Dominion						
Meat-expt. Slaughterhouses	144,660	142,062	400,877	221,310	1,446,930	84,900
Abattoirs	47,857	13,285	195,203	100,837	19,288	30,673
Grand Totals	192,517	155,347	596,080	322,147	1,466,218	115,573
In addition the following stock were slaughtered at rural slaughterhouses for local consumption during the 3 months ended 30/6/39	19,541	673	57,376	Unknown	2,916	7,259
Same Period, 1938: Meat-export Slaughterhouses and Abattoirs	164,605	170,761	711,365	421,602	1,305,677	170,639
Rural Slaughterhouses 3 months ended 30/6/38	22,099	786	53,140	Unknown	2,648	7,359
Same Period, 1937: Meat-export Slaughterhouses and Abattoirs	173,687	189,404	563,676	312,444	1,421,031	187,627
Rural Slaughterhouses 3 months ended 30/6/37	22,513	637	54,253	Unknown	2,057	7,311

Heavy Crop of Oats

A farmer of Lochiel, Southland, used 29 balls of binder twine in cutting a field of 17 acres of oats. The stooks were so close together that it was necessary to uncouple the team of three horses used in the binder to get them out of the paddock.

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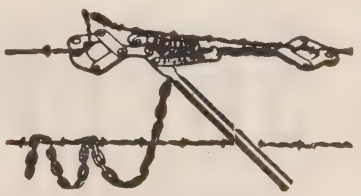

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Veterinary Notes for the Farmer

Discussions on First-Aid Measures

Contributed by the Livestock Division

Red Worms in Horses

OF the internal parasites affecting horses, probably the one which causes most concern among breeders is that known as the red worm. Although horses of all ages may harbour this parasite, the condition produced by gross infestation is much more serious in young horses.

In order to exercise control measures over this condition one must have some idea of the means by which young horses become infected.

The mature worm, which inhabits the large bowel of the horse, lays eggs which pass out in the droppings. Provided the conditions of temperature and moisture are suitable, these eggs hatch and small worms emerge, but further development is necessary before these worms are capable of infecting other horses. The time taken to reach the infective stage varies from a few days to weeks.

Infection

The infective larvae, as the worms are named at this stage, gain entrance to the bowel by being taken up in the food or drinking water. From the bowel they enter the blood stream, where they occasionally cause trouble by becoming lodged in certain blood vessels. On leaving the blood stream the larvae again enter the digestive system, where they develop into mature worms in the large bowel.

Symptoms exhibited vary with the number of parasites present. Young horses which are heavily infested become very unthrifty and the coat is dry and rough. As the disease develops the affected animals gradually lose condition, becoming weak and anaemic. In some cases diarrhoea is present.

A less frequent symptom, but one which is occasionally shown, is that of colic, the abdominal pain resulting from larvae becoming lodged in the blood vessels supplying the bowel. Some obscure forms of hind-leg lameness may be traced to the effects of the larvae in the arteries carrying blood to these parts.

Treatment

Medicinal treatment has an effect only on the mature worms in the bowel, and has no action on those in the immature stage which are distributed in other parts of the body. However, beneficial effects may be obtained by expelling as many of the adult worms as possible. A suitable drench for this purpose is:—

Turpentine, 2 ounces.
Raw linseed oil, 1 pint.

There are other drugs which are very effective in dealing with the adult worms, but as these may in some cases be highly poisonous if not carefully prescribed, their use should be left to a qualified veterinary surgeon. In addition to medicinal treatment, it is important that nourishing food, such as crushed oats and bran, be supplied.

Control

On farms where trouble is experienced from the effects of red worms, it should be the aim of the person in

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charge to prevent as far as possible gross contamination of the pastures. The risk of heavy infestation may be minimised by keeping young horses off paddocks which have been used largely for grazing other horses. Remember that the larvae reach the infective stage on the pastures, and also that they may remain active on the grass for about 12 months.

Horses should not be allowed to graze the same paddocks for long periods. Overstocking with horses may lead to heavy contamination of pastures.

On some stud farms the practice of removing horse droppings from the paddocks each week is adopted, with good results.

Answers to Correspondents

"Wooden Tongue" in Cattle

"PUZZLED" (WHATATUTU):—

Will you please give me some information about wooden tongue in cattle. I have an idea there was an article on this subject in some previous publication, and, if so, please give me date of the "Journal."

I have had two cows affected lately in the stud herd. I treated them with potassium iodine, which seemed to effect a great improvement. But is this cure lasting, and would it be safe to breed from the cows again?

LIVESTOCK DIVISION:—

In reply to your query, with regard to "Wooden Tongue," there has not been an article on the subject recently in the "Journal."

Under the name of actinomycosis, two closely-allied diseases occur in the head and neck of cattle—namely, actinobacillosis and actinomycosis. The former affects the soft parts, mainly the tongue, and the latter the bones and sometimes the soft issues as well.

The term "wooden tongue" is applied to the condition affecting the tongue, in which this organ becomes harder and stiffer than normal, interfering with proper manipulation of the food. The symptoms are constant dribbling of saliva from the mouth and fairly rapid loss of condition.

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The treatment for each is potassium iodide, one tablet each night and morning, and may take from 10 days to several weeks to effect a cure. In cases of bone infection a cure cannot be guaranteed, and, if it has been in existence for some time, treatment is not recommended.

Actinomycosis is gazetted under the Stock Act, and it notifiable.

Potassium iodide tablets are sold by this Department at 5s 6d for 50 (plus 6d for postage). This number is usually more than enough for a treatment. If the treatment is continued for some days after the symptoms have disappeared cure should be complete and not recur, and there is no danger in breeding from the cows.

Premature Calving

H.S. (THAMES VALLEY):—

I am having a lot of trouble with my cows this season, and would like to know if you could give me some idea of the cause of the trouble and the cure.

Five cows dropped their calves at about seven months, but the curious part of it was that they started to spring up some time before, just as if they were at the full time, and are milking just as well as if everything was normal. Five others have dropped calves at from 10 days to three weeks before due time, and also are milking as usual.

The first cow dropped her calf in May before the weather broke. For about the last two months the cows have little beyond plenty of good hay from a shed.

The previous two seasons I had one cow which slipped each season and I washed her out with Lysol. I have always buried all discharge I could find, and have used Lysol as a wash. The pasture has been well topdressed for years with super and ammoniated super, but I have used very little lime. Do you think a lack of lime would cause the trouble?

Would you advise me to wash all affected cows before turning them to the bull, and what would you recommend me to use?

LIVESTOCK DIVISION:—

The evidence suggests that your cows are affected with the disease of contagious abortion, a disease due to a specific germ and not connected with a lime or other mineral deficiency. It appears as if the disease has been in your herd for some years, and that this year you have had a severe storm of the disease, which appears to have broken down the partial immunity existing in the herd.

If you have brought in any new cows or heifers during the year a fresh virulent strain of the germ has probably been introduced. The existence of the disease could be confirmed by the collection and testing of blood samples from the aborting cows. This could be arranged through your getting in contact with the Inspector of Stock, Thames.

At this stage the usual precautions in regard to the burning or burial of all discharges should be carried out. The affected animals require special attention at the time of the abortion to ensure that all the cleansing is removed and that the womb is left in a clean, healthy condition; otherwise there may be experienced a difficulty in getting the cows in calf.

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There will be plenty of scope this month to buy just that butterfat backed Jersey bull you want. Write for catalogue and have the Auctioneer act on your behalf, or better still, go along and make the choice yourself.

Write for the colour booklet, "Jerseys and Higher Farm Incomes," and also enquire about the advance Register of Merit for 1939 containing particulars of C.O.R. testing, etc., from the Secretary,

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Washing out the womb daily or twice daily for the first few days after an abortion will assist in removing the cleansing and all discharges from the womb. A warm solution of salt and water, using three tablespoons of salt to the gallon of clean boiled water used at blood heat, will be found a useful douche for washing out the womb. The tail and hindquarters should be washed down with Lysol and water while any discharge is coming away.

The best time to wash out the womb is immediately after calving or an abortion, when the womb is still open. If the cleaning up of an infected womb is left till the breeding season, it is then a matter for a qualified veterinarian, and even then good results are not always possible.

If the cows have been reasonably well cleaned up at the time of the abortion there is no need to wash out again before the cows are put to the bull. It is important that aborting cows should not be put to the bull until at least two months after all discharge has ceased. They frequently appear in heat at a much earlier date, and this requires watching.

Any animal showing evidence of a discharge should not be put to the bull until, by means of washing out, you are satisfied that all the discharge has ceased.

Although a lack of lime in itself would not be responsible for abortion or slipping, it is advisable to build up the mineral content and balance of pastures to ensure robust and healthy stock, which naturally are not so susceptible to disease as stock suffering from any degree of mineral unbalance or mineral deficiency.

Advisory Service on Veterinary Matters.

Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

Value of Protein

PROTEIN (NORTH AUCKLAND):—

I was interested in your article on the value of protein for wintering store pigs by Mr. C. F. Ballinger, Ruakura. Would you please advise through your columns the protein value of fern root and clover and ryegrasses (if any) for the wintering of store pigs.

ANIMAL RESEARCH DIVISION:—

The protein value of fern root is not known so far as I am aware. It is known, of course, that wild pigs live mainly on fern roots, and that domestic pigs, particularly sows, are wintered on fern country.

No trials have been carried out at Ruakura on the value of clover and ryegrass as a sole source of food for wintering store pigs. It is, however, a satisfactory source of protein when pigs are fed a ration of maize or barley which are deficient in protein. Used as a source of protein with grain, the grass or clover then supplies about 10 per cent. of the total ration.

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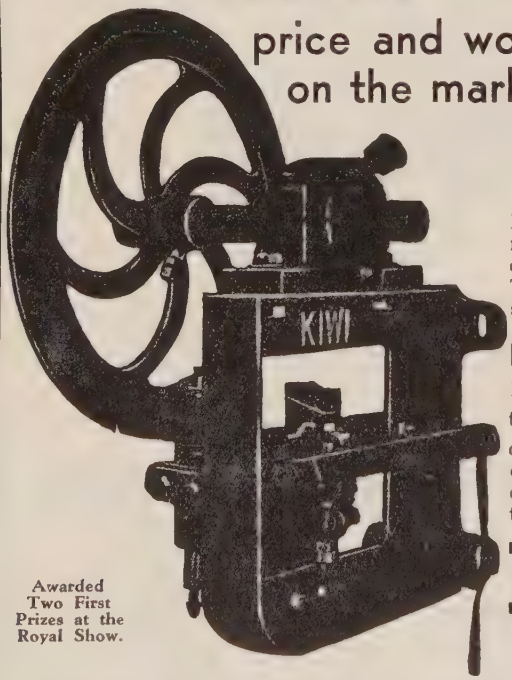

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Farm Practice and Management

Contributed by Officers of the Fields Division

Good Clover Is Essential

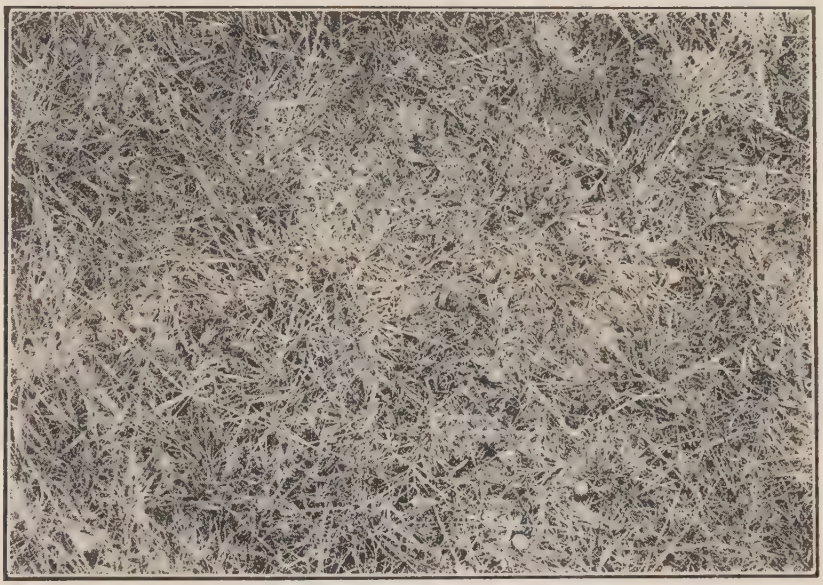

Fig. 1—A poor sward, due principally to lack of clovers.

ALTHOUGH very few grassland farmers when ordering seeds for sowing down pastures fail to include the best strains of grasses in the mixture, many overlook the importance of the rapid establishment of equally good clovers. While the value of a well-balanced grass and clover sward is generally recognised, it is surprising to hear the opinion freely expressed and transmitted into farm practice that as clover establishes naturally its inclusion in the seed mixture is not necessary.

Critical examination of swards in areas in both light and heavy rainfall districts where clover establishes naturally reveals the fact that this clover is generally of a short-lived, low-production type, and definitely inferior to a certified strain included at sowing down.

While it is admitted that in some cases the local volunteer white clover is apt to reduce or definitely suppress the certified lines in the early stages of growth under certain conditions, a little extra spent in fertilisers and lime to maintain the good type is amply worth while. Again, the cover from the volunteer type is generally slower, and this is important not only from the point of view of weed control, but also in its relationship to the vigour and general value of the sward as a grazing proposition.

Observations on sown fields as well as on strains trials throughout the Dominion have amply demonstrated the fact that the better types of white clover are able to retain vigour and

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produce feed under adverse weather conditions to a much greater extent than are the volunteer types, and this is of extreme importance, especially under low rainfall.

The illustrations provide an interesting comparison of the value of a rapid establishment in an area sown with a good strain of white clover as compared with another where reliance was placed on a volunteer. From the many available comparisons in the field throughout the grassland farming districts the value of the early establishment of a good strain of white clover has been so efficiently demonstrated that it can be confidently recommended.

—A. G. ELLIOTT, Crop Experimentalist, Wellington.

Fig. 2—A vigorous sward in which certified white clover is playing a vital part in maintaining a high-producing and well-balanced pasture.

Handy and Efficient Spray Outfit

MANY types of spray pumps are used in the control of noxious weeds. These vary from bucket models to the handy knapsack varieties, but where large areas have to be covered, there are few outfits which will surpass the small motor-driven force pump illustrated in Fig. 1.

The small force pump, with an output of about 80 gallons per hour, is driven by a small, two-stroke petrol engine. In the illustrations the plant is being used to spray blackberry on roadsides, and is connected to two hoses, one 100 feet long and the other 50 feet long. This outfit is capable of working three sprays should more be required.

The pump lifts the spray solution from the container and forces it through a check valve set in the pipe between the pump and the hoses. This check valve and the small pressure chamber keeps an even pressure in the hoses and returns all excess liquid to the containers. This returned liquid acts as an agitator, and by circulating the liquid keeps the sodium chlorate and water well mixed.

Another point which is worthy of note is that this outfit is mounted on shafts, and two men can carry it even in rough country.

Fig. 1.—The outfit. The large 40 gallon drums are used when the pump is working from the lorry, and the 20 gallon drums with handles are used in rough country.

This particular outfit is being used by the Waipa County Council in efforts to combat the district's most serious weed pests—blackberry and ragwort.

When spraying either pests a 5 per cent. to a 7 per cent. solution of sodium chlorate in water is used. For blackberry, the canes are sprayed once and the defoliated patch left until a fair quantity of second growth has regenerated, when a second treatment is given. When the third growth has begun, usually about three months after the first spraying, the patch is fired. The dry canes, impregnated

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with sodium chlorate, burn fiercely, and a clean burn usually results.

This treatment on roadsides is an annual practice, but if similar methods were adopted on the farm and the cleared space cultivated and then sown in grass and manured, the future revival of the weed could be controlled by grubbing the young plants as they appear.

Spraying Ragwort

The county also uses this outfit for spraying ragwort, and claims that this method is more effective than dry dusting with a mixture of sodium chlorate and carbonate of lime. A 5 per cent. solution of the chlorate is used, and although this does not give a complete kill, it gives the pest a severe check for about eight months, after which time some plants revive from undestroyed roots and reinfest the pasture. This check, however, enables pastures to recover, and by careful management and further attention to the pest some measure of control can be acquired.

To farmers who have large areas of noxious weeds which cause heavy outlays of capital and labour to keep in control a small outfit similar to this may be the means of a substantial reduction in the year's expenses.

—*W. T. BROWN, Instructor in Agriculture, Hamilton.*

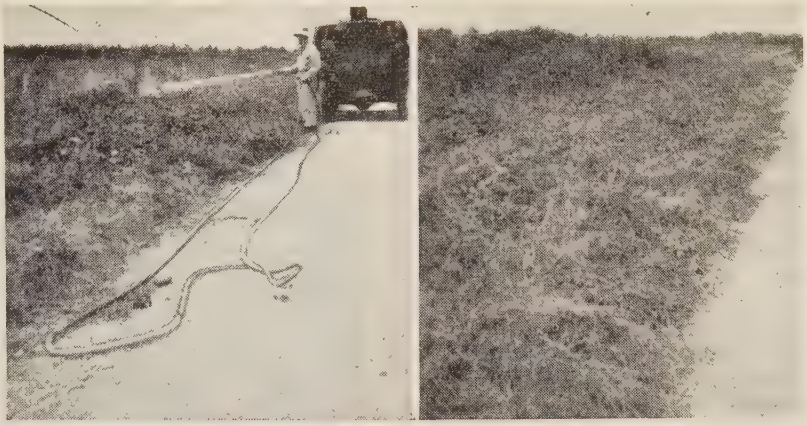

Fig. 2.—**Left: The spray at work on blackberry-infested roadsides. Right: The result of one spray. Note the unsprayed growth in the left background.**

A farmer in the Belfast district, Canterbury, in the 1937 season, irrigated his subterranean clover-ryegrass area. It is not known how much watering this clover will stand, but this season it has entirely disappeared from the area, which is now a white clover-ryegrass sward. The farmer is not at all concerned at the result, as he states he would sooner have the area in its present condition.

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Glyceria Aquatica and Drains

SO FAR, in discussions concerning the planting of *glyceria aquatica*, I have taken up the attitude that it should not be planted where there is danger of its infesting drains. I have feared that it would block the drains, or, at least, that clearing them of the grass would prove a heavy task.

The illustration, which was taken last autumn, shows a creek about nine feet wide. The *glyceria aquatica* can be seen growing between the cleaned-out portion of the creek and the dry banks on either side. Except at the edge of the dry banks, the *glyceria aquatica* is more or less floating on the water.

Before the grass was established about eight years ago the space it now occupies contained rushes and blackberry growing in water and mud, in which cattle would occasionally get bogged. The blackberry had to be cut frequently to keep it in check, and men cleaning the creek every autumn had considerable difficulty in keeping a foothold in the soft mud. Their difficulties were also increased in the long distance they had to reach in the dragging operations. The banks were also continually slipping in.

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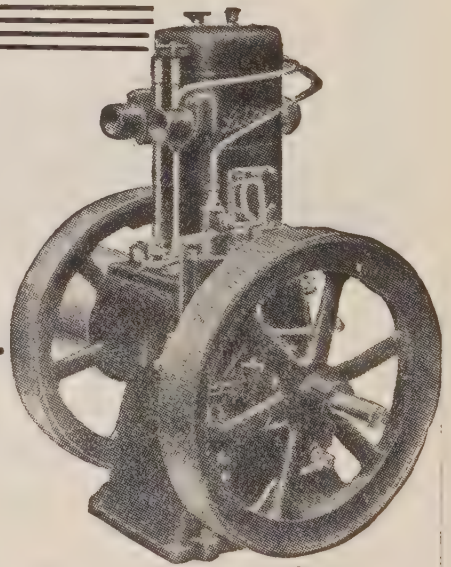

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Natural Raft

The *glyceria aquatica* spread rapidly up and down the creek, and in the early stages the farmer was worried that it would cause considerable trouble by blocking it. Later, he found that wherever it grew its extensive rooting system bound together the mud much in the same way as, but much more effectively than, the tea-tree fascines when laid down in badly-bogged gateways.

Where it is growing there is a mass of roots and soil more than two feet deep and more or less floating in the water, with the top of this mass about six inches above the level of the water in the creek. One could jump up and down on this material at the time the photograph was taken without making the slightest impression on the surface. The whole mass would give to the force of the jump and gently rise back to its original position. This natural raft of grass roots and soil enabled the drainers to carry out their yearly dragging operations closer to the centre of their work.

The edge of the artificial bank could be cut while standing on the solid mass of *glyceria aquatica* growth. The grass in the centre of the creek could then be cross-cut into pieces three or four feet long and dragged out by using a drag with three teeth nine inches long yoked to a good horse by a long chain.

Planting Justified

The farmer considers that the heavier work required in cleaning the creek is more than offset by the effect of the grass in making firm the bogs where cattle at one time could not go, in its growing up the banks and keeping them from slipping, and by keeping out blackberry, rushes, and swamp weeds. That is to say, even if this grass had no feeding value, in this particular instance its planting has been justified. In dry summers when feed is scarce it is a pleasure to see the cows strung along the creek feeding on *glyceria aquatica*, on which the farmer considers they do well.

Although I have not advocated the planting of swamp grasses where they may interfere with a drainage system, I believe that the chances of their doing much damage in that direction are slight.

The field to the right of the creek was laid down to new grass about four years ago, and I noticed that the stock in the spring of that year ate impartially the young growth of *glyceria aquatica* and the young ryegrass.

—J. E. BELL, Instructor in Agriculture, Auckland.

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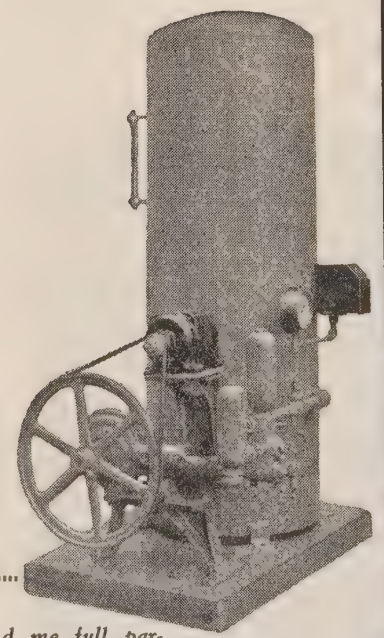

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Eradication of Scotch Thistle

IN the lower rainfall areas Scotch thistles occur only on the best lands, where they appear to be easily controlled. In the higher rainfall areas, however, where heavy topdressing is practised, Scotch thistles are a very persistent weed in the better pastures. If allowed to mature and seed, they ruin the sward.

To control this pest many methods are used, with varying degrees of success. The practice of shearing off the leaves of rosette plants at ground level with an adze or spade will check the plant for a short period. However, this merely aggravates the position, as the plant usually regenerates from the roots and forms a multiple-crowned thistle, which ruins a greater area of pasture than the undisturbed plant.

Another practice aims at the destruction of seed, is the practice of mowing the thistles after the seed stalks have grown, all seed stalks and seed being collected and burned. Although the thistles will again produce fresh stalks, these also can be destroyed and a large amount of reseeding prevented.

A satisfactory method of eradication is either to spray with a 5 per cent. solution of sodium chlorate or to dust with a 5 per cent. mixture of sodium chlorate and lime while the plants are in the rosette stage. Although this treatment leaves a bare patch in the pasture for some time, it usually kills the plant and prevents the formation of seed. After a while the toxic effect of the poison disappears. Pastures then revive and fill up the bare patches.

Fig. 1.—A field heavily infested with Scotch thistles.

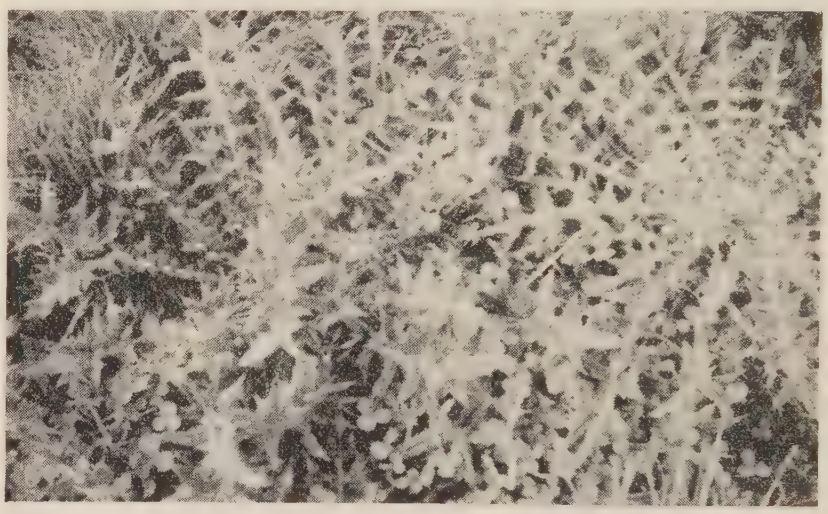

Fig. 2.—Scotch thistle with multiple crown. These two crowns are growing off the same root, due to the vigorous plant being cut back at an earlier stage.

Fig. 3.—A bare patch after dusting with sodium chlorate. Note the remains of the thistle.

—*W. T. BROWN, Instructor in Agriculture, Hamilton.*

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Control of Bidi Bidi in Hill Pastures

ONE of the worst weeds in many hill pastures of both the North and South Islands is piri piri, or what is commonly known as Hutiwai, or bidi bidi. Piri piri belongs to that group of plants which spread by means of overground runners. These root as they grow, and require a close-eaten or bared-out turf to do so.

It can safely be said that in the South Island the spread of the weed has been largely due to the rabbit pest, for during the Great War period many of the hill country farms became badly infested with rabbits, and it was a common sight to see whole faces of country-side and especially sunny faces —eaten bare of grass. Replacement of herbage on these faces was, in the main, by piri piri. There are other causes of the spread of the weed in the South Island, and no doubt the continual burning of the tussock country has been one of them.

In the North Island, except in certain localities, the rabbit pest has never been such a menace, and the spread of piri piri is due mainly to close and continuous grazing by sheep, making conditions ideal for the spread of the weed. Sheep will not penetrate into patches of piri piri, and will graze only the grass around the edges, while cattle are not averse to eating the weed and will readily graze in the patches.

Control in Pasture.

For successful spread the runners of piri piri must have full light, and by spelling pastures for a period the runners are kept from the ground surface and run along the top of the grass as loose trailing stems. Control is affected by systematically spelling areas during the summer to allow the grass to lift the runners up, forcing them away from the ground. The heavy stocking of such areas with cattle in the autumn and in the winter results in the cleaning up of a great deal of the weed which has been prevented from re-rooting.

By working over the farm, spelling a paddock or two at a time, it will be found that the weed is lessened to a large extent and, further, that the pastures will have benefited considerably by the spelling. It is necessary to repeat this process, and a scheme of systematic spelling and heavy cattle stocking of paddocks in turn, in order to repeat the process every five or six years on each paddock, will be found beneficial to the pastures to a marked extent, as well as controlling piri piri.

Close and continuous grazing by sheep make conditions ideal for the spread of piri piri.

Topdressing.

The top-dressing of pastures is also of extreme benefit in controlling piri piri, and this is due to the increased carrying capacity and the strengthening of the grass and clover sward. Pastures which have been badly affected

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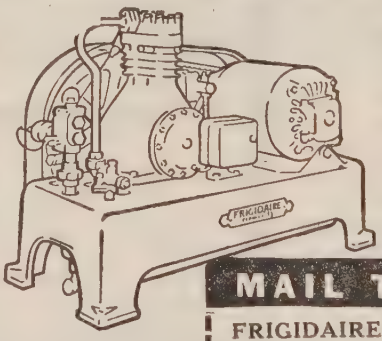

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with the weed and which have been top-dressed for two or three seasons are seen to have benefited considerably, and the piri piri is weak and gradually dying out.

Control by Insects.

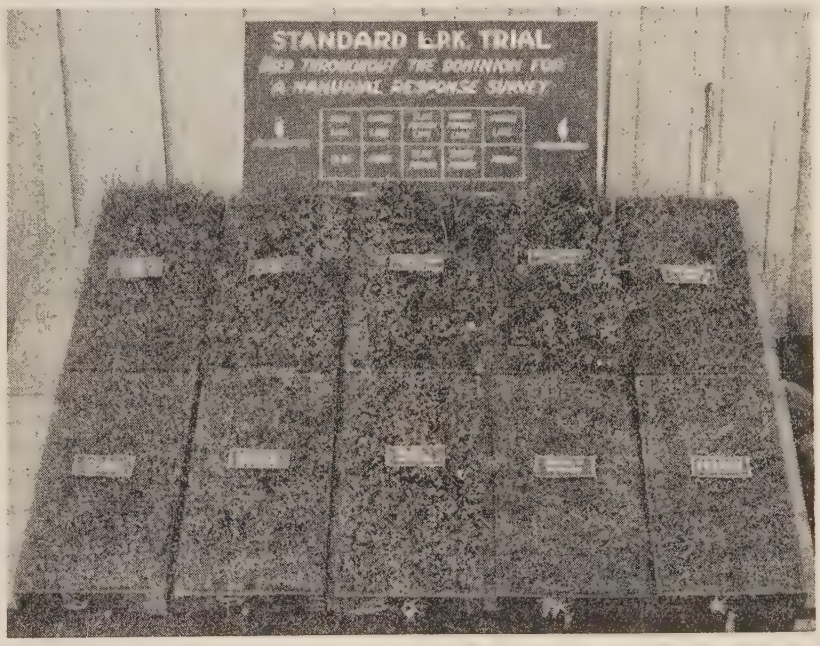
The only native insect attacking piri piri to any marked extent is a species of mealy bug, and this infests the roots, but it is only occasionally that this insect markedly checks the weed. During the last few years an insect known as the Chilian saw fly has been imported from South America and is being bred at the Cawthron Institute, Nelson. Field liberations have been made in Taranaki and in Poverty Bay, and the insect is being concentrated to build a sufficient population under field conditions.

Under experimental conditions the saw fly has considerable powers of control, but it is a slow breeder and will require time to build up its population. The work of field establishment cannot be hurried beyond importing, rearing, and liberating the insects in countless numbers. Apart from this, the matter lies with the insect itself, and with its environment.

—J. M. HOPKINS, Instructor in Agriculture, Taumarunui.

Fertiliser Response on Old Volcanic Soils of North Auckland

THE accompanying photograph serves to illustrate the standard L.P.K. trial used by the Fields Division, Department of Agriculture, throughout the Dominion for a manurial response survey over a period of the last eight years. The symbol L. stands for lime, P. for phosphate, and K. for potash.



Trials similar to that illustrated have been laid down throughout the Dominion on private farms covering many different soil and pasture types. The trials received exactly the same treatment as regards grazing, harrowing, etc., as the fields in which they are laid down, the only difference being that they are manured each year with the same measured quantities of fertilisers and are not topdressed by the farmer when he applies fertiliser to the fields in which they are situated.

The trials are topdressed each autumn, the slag and superphosphate plots receiving 3 cwt. per acre, potash plots 2 cwt. per acre, and lime plots 1 ton per acre at time of laying down, followed by 5 cwt. per acre annually.

The turfs shown in the illustration were taken from an actual trial which was laid down in 1934 on an old volcanic soil type. The treatments described have been applied annually during the five years the trial has been in progress, and the results shown in the illustration clearly define the responses obtained from these fertilisers on this soil type.

It will be seen that potash alone gives practically no response, but a slight response when used with lime. Superphosphate plus potash gives a similar response to potash alone, but with lime this mixture gives an excellent response. Slag plus potash gives a good response, and with lime an excellent response. Superphosphate alone gives a very poor response, but with lime very good response, while slag alone gives a fair response, and a very good response when used with lime.

The lesson to be learned from this particular trial is that lime is essential to obtain a good response from phosphates, and that both lime and phosphate are necessary to obtain an improvement from potash.

—E. B. GLANVILLE, Instructor in Agriculture, Whangarei.

Dairy Science Abstracts

The first issue of the "Dairy Science Abstracts," issued by the Imperial Bureau of Dairy Science, Reading, England, gives every indication that this new publication will prove of real value to all concerned with dairy science or with the dairy industry. The need for a satisfactory abstract journal to cover the large and growing dairy literature has been increasingly felt in recent years, and this new publication promises to fulfil this need.

Feeding Pampas Grass on Hill Country

Fig. 1.

Fig. 2.

THE utilisation of pampas grass as a supplementary fodder on the hill country of the central North Island districts has occupied considerable attention during recent years, and it is gratifying to learn of the success of some farmers with this crop.

The chief problem in these districts is the wintering of a sufficient number of cattle to crush secondary growth in the spring successfully. Cattle are undoubtedly the best medium in this respect, but, to keep down bracken fern and other growths, they must come out of the winter in a strong and healthy condition. In the ordinary course of events farmers are forced to sell off a certain number of their cattle in the autumn and to buy again in the spring. Economically this is not a sound practice, for the farmer is selling on a falling market and buying on a rising one.

Generally, the critical months for feed are July, August, and September, and it is at this time that some extra fodder is needed to tide stock over the winter. In most of the hill districts only limited areas are suitable for swedes and for hay crops. Pampas grass is, without doubt, the ideal fodder to supplement these crops further.

Establishment

One of the most successful methods of establishing plantations is first to establish seedling plants in a nursery in the spring when danger of severe frost is over. The plants are spaced 1ft. apart and in rows 2ft. apart. The plants are kept in the nursery for one year, and in that time they stool out considerably and grow to a height of between four and five feet. In the spring all foliage is removed from the plants to within approximately 1ft. of the soil surface. They are then lifted and transplanted to the permanent position in the plantation area.

This method has been adopted with considerable success by a farmer in the Ohura district. In this way plantations have come to the feeding-off stage in two years from the time of transplanting to the permanent site. This farmer is also increasing his plantation areas each year. As soon as the nursery is empty it is again planted with seedlings from Whangarei.

The highest cost in establishing plantations is the fencing of the areas. Fences should be of a permanent nature and absolutely stock-proof. Some preparation should always be made for the plants in the winter before planting out. This should consist of spitting the holes and loosening the soil to allow weathering and aeration. Planted 6ft apart each way, it takes approximately 1000 plants to cover an acre.

Fig. 1 shows pampas plants in a nursery bed. Plants average between three and four feet in height, and have been in the nursery for seven months.

Fig. 2 shows a plantation of pampas grass eight months after transplant-

Fig. 3.

ing from the nursery. Plants average between four and five feet in height.

Fig. 3 shows a plantation on hill country eight months after feeding-off. In that time the bushes have made between five and six feet of growth.

Fig. 4 shows the same area from a different angle. The farmer has removed most of the flower heads from the bushes.

Fig. 5 shows a plantation 3½ years old and ready to feed off this winter. At the time of photographing the bushes were just coming into flower head.

Fig. 4.

Fig. 5.

Feeding of Pampas

Where plantations are established at long distances from the farm headquarters, it may not be possible to give cattle short periods on the feed each day. In these circumstances the general practice is to fence in breaks as for swede crops, and so eke out the feed in this way. On the other hand, if plantations are handy to the homestead cattle can be given half to one hour or more on the areas each day.

In conclusion, it may be stated that just as much care should be exercised in establishing pampas grass as is given other crops, for, with care and attention, its success is a certainty. Perhaps in this district the time between the establishing and feeding-off stages is longer than in some of the warmer districts, but the gain in the end is well worth waiting for.

It is to be hoped that the success of individual farmers will inspire others to start plantations, and so indirectly help to keep down secondary growth on the country in question.

—J. M. HOPKINS, Instructor in Agriculture, Taumarunui.

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Horticultural Instruction

Contributed by Officers of the Horticulture Division

Orchard Notes

Cultivation, Spraying and Grafting

THE Winter work of pruning, attention to shelter belts, drainage and general maintenance work should be completed early so that there is no hindrance in carrying out the very essential spring operations of applying certain foundation sprays, upon which success in disease control is so dependent, and also in bringing about a good state of cultivation. This will have the beneficial effect of warming and aerating the soil and promoting root activity in orchard trees, thus stimulating the production of healthy foliage and inducing the necessary vigour required in developing a heavy crop.

The main efforts over the growing season are directed towards pest and disease control and cultivation of the orchard land. These operations are the essentials in producing the quantity of disease-free fruit. Other operations, such as fruit-thinning at the appropriate time, go a long way towards improving quality and securing uniformity in fruit size, a subject which will be discussed in later notes.

Disease Control

Spraying is depended on, in the main, for controlling fungous diseases and most insect pests which affect fruit and fruit trees, although other orchard operations and orchard conditions generally have an important bearing on the incidence of disease. The general health of the tree should be considered in connection with disease control, as a tree weakened through over-cropping, brought about by consistent light pruning or failure to prune, lack of general attention, poor drainage, and such causes, is more liable to suffer spray injury than a tree in a reasonably vigorous state.

Dense trees are difficult to spray, in addition to creating a condition favourable for the development of fungous diseases. Excessive shelter will create similar conditions. Early fruit-thinning will assist in disease control as, by breaking up fruit clusters, more complete coverage is secured and less protection is afforded such insect pests as leaf rollers and codling moth larvae.

Success in Spraying

With modern spraying appliances and the use of good materials, disease control to a very high degree is now possible. Success depends on three important considerations—the time of application, the suitability of the material, the strength at which it is applied, and, most important of all, thoroughness in application.

Early sprayings are regulated to a large extent by the stage of development of blossom buds. One should therefore study their development and be in readiness to apply a spray at the appropriate time. Materials are fairly well standardised, and growers are well protected in the purchase of materials by a system of certification of such products. Every part of a tree must be thoroughly wetted to secure complete control of any disease or pest.

Equipment should be adequate for the size of the orchard. Good spraying is more likely to be achieved where the pump is of sufficient capacity to give good volume delivery under good pressure, especially where trees are large, for otherwise the essential time required to cover every part is not likely to be given.

In cases where the pump is of small capacity and pressure is low and spray volume is correspondingly low, considerably more time must be taken over the work, as the quantity of liquid applied per tree is just as important as correct dilutions of materials used. The general trend in spraying practice is to use greater dilutions of the materials employed, and to improve coverage by improvement in pump capacity and spraying equipment generally.

It is better to increase the gallonage at each application rather than to attempt to secure better control by using materials at a greater strength than recommended, as the danger of spray injury is not so great.

Spray Schedule

During September the first sprays in the general spray schedule for apples and pears become due, and already in some districts on at least some varieties the first application of a fungicide may have been applied. As a first application Bordeaux mixture 5-4-50, or lime-sulphur 1-30, are used, according to kind and variety of fruit to be sprayed. Bordeaux mixture is a more potent fungicide, and is preferred for general use at the green-tip stage of bud development.

Used at this period, when bud scales have lifted and over-wintering spores of black spot are exposed, Bordeaux

may be regarded as a cleansing spray, destroying over-wintering spores, thus providing some immunity from attack. Subsequent applications of sulphur sprays will destroy spores from various sources which may alight on fruit and foliage. Certain apple varieties not so subject to black spot but more subject to powdery mildew infection are better sprayed with lime-sulphur 1-30 at the green-tip period.

A complete spray schedule for the control of the principal pests and diseases of apples and pears is set out below, but it may require slight modification to meet special circumstances. Recommendations in connection with the use of lime-sulphur refer to commercial brands containing 15 per cent. poly-sulphides, which is practically standard.

Apples

(1) **Green-tip Period.**—Bordeaux mixture 5-4-50; or lime-sulphur 1-30.

(2) **Open-cluster to the Pink Period.**—Lime-sulphur 1-150, plus colloidal sulphur 2 lb. to 100 gallons of the mixture. Note: It is an advantage to weaken the lime-sulphur to summer strength at this stage and supplement with colloidal sulphur to reduce russetting. The alternative is to use lime-sulphur 1-75.

(3) **Petal-fall Period.**—Lime sulphur 1-150, plus colloidal sulphur 2 lb. to 100 gallons, plus lead arsenate 1½ lb. to 100 gallons, plus hydrated lime 3 lb. to 100 gallons.

(4) **Ten to 12 Days Later.**—Repeat No. 3.

(5) **Seventeen-day Intervals up to Mid-December.** — Lime-sulphur 1-180, plus colloidal sulphur 2-100, plus lead arsenate 1½-100, plus hydrated lime 3-100.

(6) **Subsequently at 14- to 21-day Intervals until end of January and later as required on later Varieties.**—Lime-sulphur 1-200, plus other ingredients as in No. 5.

In addition to the pests combatted by the use of lead arsenate, other pests which attack the foliage may require special treatment by contact sprays and fumigants. For instance, apple leafhopper may become troublesome if no effort is made to destroy this pest when it first appears. In some districts under dry and warm seasonal conditions it may appear in appreciable numbers by the end of October.

A close observation on foliage near the base of the trees should be made from early in the season, and spraying with nicotine sulphate 1-800 should be carried out while the insect is still in the nymph stage, following which little subsequent trouble is likely to be experienced that season.

Red mite may also appear any time during the summer, and can be destroyed only by the use of summer oil. As it is difficult to apply summer oil before January without in some way interfering with the general spraying schedule for the control of fungous diseases, it is necessary to guard against an early attack if possible by destroying winter eggs where they are present in quantities by using a winter-oil spray during dormancy and then using a combination of lime-sulphur and colloidal sulphur for the early summer months.

Stages of Apple Blossom Development.—(*1*) Green-tip; (*2*) tight cluster; (*3*) open cluster; (*4*) pink; (*5*) full bloom; (*6*) petal-fall; (*7*) calyx closed. —Drawing by N. J. Adamson.

Pears

(1) **Green-tip Period.**—Bordeaux mixture 5-4-50.

(2) **Pink Period.**—Bordeaux mixture 3-4-50, or lime-sulphur 1-75.

(3) **Petal-fall Period.**—Bordeaux mixture 3-4-50, plus lead arsenate 1½ lb. to 100 gallons or as for apples.

(4) **Later at Intervals.**—Spray as for apples.

Certain pear varieties will not tolerate so much Bordeaux mixture, but a smoother-skinned and more attractive-looking pear is produced when

the sulphur sprays are applied. However, under certain conditions it is impracticable to depart from Bordeaux mixture until later in the season, especially on such varieties as Winter Nelis. The alternate programme suits such varieties as Winter Cole and P. Barry. Josephines will not tolerate Bordeaux mixture after green tip, and they should be treated as would be recommended for the more delicate apple varieties.

Bordeaux mixture 5-4-50 is prepared by using 5 lb. bluestone and 4 lb. hydrated lime of high purity to 50 gallons of water. The method of manufacture is to dissolve the bluestone and almost fully dilute with the bulk water to make up almost the required quantity of spray. The hydrated lime should then be made into a milk with a smaller quantity of water and poured into the bluestone solution while the agitator in the spray vat is running. Further water may then be added to bring up the quantity to give the correct dilution.

Where considerable quantities of Bordeaux mixture are required it is necessary to prepare for the work by having sufficient bluestone in solution for at least a day's requirements. A stock solution may be made by dissolving a quantity of bluestone in a wooden barrel by suspending a known weight in water near the surface and having the liquid in the barrel measure as many gallons as pounds of bluestone used. Then, to measure out say 10 lb. of bluestone, it would be necessary to take 10 gallons of the bluestone solution.

Grafting

Unsuitable varieties may be changed by grafting, and the work may proceed as soon as the bark will lift freely. It is sometimes possible to begin by mid-September, and the work may be continued well through October, so long as the scions are kept in good, fresh condition and have not made appreciable movement.

Varieties for reworking should be selected from the better commercial varieties, keeping in mind the advantages gained from a good succession in affording a good distribution of labour through the harvesting season while avoiding, as far as possible, having too many small lines. For northern districts, Tasma might be recommended as a good variety for replacing Delicious, which may have certain weaknesses when grown in the northern areas.

More recently, consideration has been given to the idea of "refurnishing" mature apple and pear trees of good framework in changing the variety—an alternative to deheading and grafting to stumps of main limbs. By refurnishing, much saving of time is effected in bringing trees back into full production, although the initial expense is greater because of the greater number of scions inserted. Not more than two seasons are lost before refurnished trees are producing, whereas by the older method a new framework has to be formed, which normally takes up to five and six years.

Refurnishing Trees

In "refurnishing," the trees are almost skeletonised, and scions are introduced along the whole length of main limbs. Surplus limbs are cut out, and the remaining limbs are shortened slightly. Laterals and horizontal arms, suitably placed, are cut back to short stubs for grafting, while others are removed entirely. Grafts are also placed on the top of shortened leaders.

In addition to grafting on to suitably-placed laterals and horizontal arms, additional scions may be inserted into the bark of the main limbs. This is done by the inverted "L" method, which is just a modification of rind grafting. The scion is cut wedge-shaped and a thin strip pared off one edge. An inverted "L"-shaped incision is made in the bark of the limb, the corner raised, and the scion inserted so that the pared edge lies against the vertical edge of undisturbed bark. The scion may be held in place by a tack, and should be sealed with a good grafting compound.

It is a mistake to insert scions too closely, as the tree will soon become too crowded. Scions should not be closer than 15 to 18 inches.

It is sometimes found expedient to compromise between the complete refurnishing and the cutting back to stumps by heading fairly high and reworking at the top while refurnishing the lower framework. This method is less laborious, but means a reduced yield for the first two years of recropping.

—N. J. ADAMSON, District Surveyor, Nelson.

Citrus Notes

Pruning, Cultivation and Planting

NOW that the frost period is over all affected trees should be pruned. Remove all dead wood, and at the same time endeavour to re-form unpruned and neglected trees. The sooner this work is done the more rapidly will the trees recover and have mature foliage prior to next autumn. The effects of frost during the past winter were light on New Zealand grapefruit or Poorman Orange, so that the worst-affected lemon trees, if removed, may be replaced by this hardier kind of citrus or by trees on a more resistant stock, such as *Poneirus trifoliata*, provided the type of soil is suitable.

This is also a good time of the year to undertake the annual pruning in all citrus groves. Trees must be formed with a good, strong framework, and branches which are too close to the ground should be either pruned out or shortened back. All sucker growth should be removed, unless it is to re-form part of a tree broken by wind damage, and all crossing branches and dead wood should also be removed. From September to December are the most suitable months for the pruning of citrus trees. The main crop has been harvested, and the trees respond rapidly.

Cultivation and manuring should also proceed as quickly as possible. During the spring months the soil should receive thorough aeration, and quick-acting manures should be applied. If they are cultivated too late in the summer and growth is forced in autumn by nitrogenous manures, citrus trees are more susceptible to frost damage, so that every effort should be made to secure good spring growth now.

Loss of Fruit

Considerable loss of fruit was caused last season during the showery spring by *Citrus verrucocis*, although the effects were not noticed by many growers until picking in May-June. Where this fungous disease has become established one or two Bordeaux sprays in the spring may be inadequate. It is essential to keep the young fruits covered with Bordeaux, and it is now recommended to apply the first 3-4-50 Bordeaux before the blossoms open.

The 3-4-50 Bordeaux should be prepared by the grower personally on his own orchard. To prepare 100 gallons, dissolve 6lb. of the bluestone suspended in scrim in six gallons of water in the spray tank overnight, or add boiling water to the bluestone in a porcelain or wooden vessel. Then fill the spray tank up to the three-quarters mark. In a separate vessel mix the 8lb. hydrated lime to a thin paste with water, and then pour this into the spray tank, stirring the mixture, and add water until tank is full. Stir for a few minutes, and the solution is ready for use. The corresponding quantities to prepare four gallons of 3-4-50 Bordeaux, that is, a kerosene tin full, are 4oz. bluestone and 5oz. hydrated lime.

Be sure to apply the spray thoroughly. Good spray coverage is essential in combating a fungous disease, as prevention is all-important. Once the young lemon fruits are infected no future sprays will rectify the damage done, and this may not become apparent until the fruit has neared maturity and has then to be discarded through being diseased and thus unsuitable for the market or for peel purposes.

Planting Young Trees

September is also a suitable time for the planting of young citrus trees, and this operation should now be completed as rapidly as possible. Unless the area is adequately sheltered, young trees are better planted in a nursery row for a year or two. By this means they may receive concentrated attention in the forming of the trees and increased root development in a sheltered area before planting out.

One of the most common mistakes made by many new growers is to plant the orchard too soon. Unless the area chosen has been well sheltered and the soil is in good tilth, do not plant this year but place the young trees in a nursery row until next planting season. Plant only trees that are well formed, with a good straight trunk of at least 15in., bud union clear of ground-level by 3in., and in a state of healthy growth. Do not plant stagnant or deformed trees.

For any further advice communicate with the local Orchard Instructor of the Department of Agriculture, and do not wait until the newly-planted trees require to be registered.

—L. PAYNTER, District Supervisor, Auckland.

Viticulture

Phylloxera — Resistant Stocks

(Continued from August Issue.)

BECAUSE of their partial European (*Vitis Vinefera*) origin, American Vinefera hybrids are less resistant to phylloxera than the stocks produced by crossing pure American resistant varieties.

The stock Mouvedre x Rupestris 1202 (Couderc) has been used more than any other in the Dominion for grafting both outdoor and under-glass vines on. It has been found especially valuable for sustaining the vigour of vines that are forced with artificial heat annually, and under these conditions it ripens the fruit earlier than vines do on their own roots. In cool vineries and outdoors this stock has the contrary effect.

The 1202 has been, and is, a great favourite with our nurserymen, although at present it is being displaced to some extent by the Riparia x Rupestris and Berlandieri x Riparia stocks, particularly the 3306 and 420.A. It is a vigorous stock under most conditions, even on heavy, compact, wet clays (gum lands). In light and superficial soils its resistance to phylloxera is doubtful. Its cuttings root well and give a high percentage of perfect grafts, which are very fruitful, although, like some other Rupestris hybrids, it does not improve the quality of the fruit.

Dr. Henri Faes and Monsignor Albert Paschoud, in their excellent text book, "Notre Vignoble," edition 1932, state: "In a series of analyses effected during over 20 years by the Viticultural Experimental Station of Lausanne (Switzerland), the Mouvedre x Rupestris 1202, of all the series of vine stocks studied, has always produced the most acid wines."

In growth this stock keeps up to the growth of the European vine grafted on it. Its affinity with scions is good, and it is a good stock on suitable soils for varieties that are liable to become stunted, such as the Gamays and Gaillard Girerd 157. Dr. A. I. Perold (South Africa) in "A Treatise on Viticulture" states: "It has a good affinity for most Vinifera varieties, excepting Muscat of Alexandria, odd vines of which grafted on 1202 die suddenly during the first four years."

According to Pacottet, the 1202 can support an assimilable lime content in the soil of 75 per cent. Growing rootlings in the nursery require spraying to control downy mildew, to which

unlike most stocks, it is subject and in severe attacks is liable to lose all its leaves.

Principal characteristics:—Very vigorous, upright growth, slightly bushy, trunk very strong; bark thick, greyish dark chestnut. Lower rods long, thick, and straight or sinuous, round: shoots of medium length, finely channeled, reddish cigar coloured, plum-coloured at nodes; violet-green with abundant downy hairs in the herbaceous state. Leaves medium to small, globular, entire, thick, and bullate, the upper lobes being indicated by a distinct indentation, the lower lobe terminated by a large tooth. Teeth broad and acute, in two series. The leaves are light green, with dull wine colouring at the base of the nerves on the upper surface, yellowish green and smooth on the lower. Fruit small, violet black, covered with bloom. Numerous small and fairly open bunches.

The following Americo-Vinifera stocks are of recent introduction, and as soon as sufficient wood is available they will be tested for their suitability for local conditions:—Bourrisquou x Rupestris 93-5 (Couderc), Chasselas x Berlandieri 41.B. (Millardet and de Grasset), Vialla, Jacquez, and the hybrid Direct Producers Oberlin 595 and Castel 19637, which are also being used as stocks in Europe.

—J. C. WOODFIN, Vine and Wine Instructor, Te Kauwhata.

Tobacco Notes

Pricking Out Tobacco Seedlings

IT has been stated that the pricking out of tender tobacco seedlings into nursery beds is the major factor in the spread of the mosaic disease in the tobacco crops of the Nelson Province. While I agree with this statement, I do not agree that the procedure should be abandoned in favour of the seed beds being sown in the fields by each individual farmer or tobacco-grower.

The New Zealand climate is not ideal for tobacco-culture, and rules or methods which apply to the continents of America, Africa, and Australia are not always applicable here. The individual growing of tobacco seed by the Nelson tobacco-growers was attended with disastrous results during the period 1917 to 1926, when a cold snap with snow or abnormally heavy frost occurred when the seedlings were in the two-leaf stage, completely destroying all the plants. This happened twice in my own plantations during the period mentioned in spite of calico or scrim covers.

Only Safe Way

In New Zealand the only really safe way to germinate commercial tobacco seeds early enough to have plants suitable for field planting in the first week of November is to raise the seedlings under glass with controlled heat, maintaining a night temperature of 60 degrees Fah., and there are not more than 10 growers among the 450 who could undertake or manage this business for themselves successfully.

The raising of tobacco seedlings is a more delicate business than the ordinary raising and production of garden flower plants, and the business should be left to the professional glasshouse nurseryman who, under contract to the tobacco manufacturer, can guarantee the delivery of thousands of boxes of seedlings to the tobacco-growers in the first week of October.

Having this delicate and most important work undertaken by three or four professional men is as good as an insurance against the snow and frost which the Nelson district is experiencing at the present time, and every tobacco-grower will be happy to know that his share of next season's plants are at present being cared for in the warm, heated glasshouses of Nelson, Motueka, and Riwaka.

To return to the pricking out of the seedlings plants when delivered by the glasshouseman in boxes containing 1200 to 1500, I contend that the pricking out principle is right, but that the system at present practised by the growers is faulty and can be greatly improved.

Care Necessary

The virus of the mosaic disease is present in most of the tobacco lands and nursery beds of the Nelson district, and the point of entry of infection into the young plant is through the exposed tissues of a broken or bruised root. It therefore behoves the grower to exercise the greatest care to prevent damage or injury to the small cotton-like rootlets during the process of lifting the plants from seedling boxes and in setting them out into the nursery beds. If care is taken that there are no broken roots during this operation there will be a great reduction in the visible amount of mosaic.

In 1926 considerable areas of tobacco were grown in Motueka and Riwaka districts up the river, and also in the Waimeas, and there was no mosaic noticeable, but the growers were much more careful and gentle in their methods of handling the seedlings.

The procedure recommended is as follows. The nursery beds should be filled with sterilised soil in which the requisite manure has been incorporated and should be levelled off correctly and watered to a depth of four inches the evening before the pricking out is to be undertaken. A planting board 3ft. 9in. long, 5in. wide, and 1in. thick with a 1½in. bevel edge, is used to open a trench at one end of the bed by pressing it into the level, smooth soil 1½in. deep.

Recommended Procedure

The box of seedlings is handled by removing one end. The hand is passed along the bottom of the box, and a block of seedlings about 4in. square is lifted and submerged into a bucket of tepid water and then gently agitated with both hands until almost all earth has fallen off. Try to avoid entangling the rootlets more than is necessary. This handful of seedlings is then placed

in a shallow vessel filled with water, such as a pie-dish. This receptacle is placed between the two planters operating from each end of the open trench.

The planters lift the seedlings by the largest leaf with a quivering motion. This action separates the rootlets from the mass without any injury. The seedling is then placed in the trench with a sideway draw motion, trailing the roots from the centre to the edge of the bed. The second and following plants are dealt with in the same way, so that all roots are spread out on one side of the plant, pointing towards the centre of the bed, without having been touched by the hand or fingers.

The row is complete when the planters meet in the middle, and the insertion of the planting board 1½in. parallel to the first row will open the second row and at the same time fill the first row completely without any undue pressure or touching the roots with the hand. If growers will take this extra time and trouble they will be amply rewarded.

This type of pricking out was practised in past years by Mr. Joseph Smith, of Umukuri, by Wm. Rowlings, jnr., Sidney Rowling, Bert Rowling, and W. H. Owen, all of Riwaka, and by myself at Harakeke in 1925.

Cause of Deterioration

The use of the marking board with wooden half-inch diameter pegs to mark the position for each seedling in the row is, in my opinion, the cause of the deterioration of pricking out methods. This instrument allows for working on an uneven surface or badly prepared bed. The indenture made in the soil cannot possibly contain all the roots, so that they are bunched up, and the operator presses these roots into the soil with the fingers or thumb. This severe pressure ruptures the outer wall or skin of the rootlets, and allows the entry of the virus of mosaic into the plant system.

This practice on unsterilised soil has been the greatest agent in the spread of mosaic in the nursery beds, and although it may not be very noticeable during the short period from October to November, it is quickly developed when the plant is transferred from the shelter of the nursery bed to the harsher field conditions.

—CHARLES LOWE, Tobacco Instructor, Motueka.

Cool Storage Notes

Check Up on Fruit in Cool Storage

THIS is the critical time of the year for fruit which is being held in cool storage. It is, therefore, advisable to take stock of the various counts and varieties being held, and to make a thorough examination of all fruit remaining in the store.

When checking up on the condition of varieties which have a tendency to develop internal discoloration, the best method for detecting early signs of this form of breakdown is to cut the fruits and examine the flesh for signs of browning, as this tendency is difficult to detect unless it is associated with flesh collapse.

The tendency to deteriorate from internal discoloration is found in late-picked fruits, or in fruit which has been held too long after being picked before being placed in cool storage, or held for too long in cool storage. Most varieties of pears are subject to this form of internal breakdown.

Highly-coloured Sturmer apples should also be closely inspected, as this class of fruit may have a tendency to develop internal browning if held too long.

Granny Smith apples should be carefully examined and tested from now on, as external discoloration develops more quickly as the season advances.

The blowing out of cool storage chambers twice each week will materially assist in obtaining the best results with fruit held in cool storage.

—A. POWELL, Cool Storage Officer, Wellington.

New Wool Scouring Process

THE International Wool Secretariat has learnt that steps are being taken to introduce a new wool-scouring process, developed on the Continent, to the British wool textile industry. For this process it is claimed no soaps or alkalis are necessary, thus greatly reducing the risk of damage to the wool fibre which results unless careful chemical and temperature controls are employed. It is also maintained that dyeing is facilitated, and, most important perhaps, the time and cost of scouring is considerably reduced.

An additional advantage claimed is that almost complete recovery of wool fats is possible at both lower cost and in an improved form when compared with existing methods. It is only natural that any new scouring process should be regarded with considerable scepticism and the International Wool Secretariat is not in a position to form an opinion as to the practicability or merits of the process.

The Secretariat, however, has put the agent, Dr. P. Bleyer, in touch with several members of the industry and with the Director of the Wool Industries Research Association, as it seems highly desirable that the method should be investigated and submitted to comprehensive tests by the Research Association.

Vegetables, Small Fruits and Flowers

Contributed by the Horticulture Division

The Farm Kitchen Garden

ONE of the advantages of living in the country is the facilities for producing ample supplies of fruit and vegetables for the family. To do this well and economically some systematic method should be adopted. Orchard trees should not be planted in an enclosed area where the deep cultivation required for vegetables would interfere with fruit production, and the shade of the orchard trees would be detrimental to the vegetable crops. The area should be extended so that perennial crops, such as rhubarb, asparagus, seakale, and herbs, and also quick-growing salad crops, may be grown without interference from the trees and fruiting shrubs. The main-crop annual vegetables, such as potatoes, root crops, peas, cabbage, etc., should be grown on land where horse or tractor implements can be used.

A good plan to follow is to grow the orchard trees in an area by themselves. The garden area should then be quartered. one portion being devoted to perennial small fruits, another to the perennial vegetable crops previously mentioned and herbs, and the other two to quick-growing salad crops, tomatoes, and seed beds for raising plants such as cabbage and cauliflowers for planting out with main-crop annual vegetables, which may be grown with the farm root crops by means of horse implements. By adopting a method of this kind better results can be obtained at much less cost.

Plant and Sow Now

During October plant out passion fruit, tree tomatoes and Cape gooseberries, cabbage, cauliflower and lettuce, and, towards the end of the month, tomatoes, kumaras, cucumbers and melons with plants raised under glass, and also flowering half-hardy bedding plants and dahlias and chrysanthemums.

Sow main-crop potatoes, peas, carrots, turnips and beetroot, and also celery, salsify, dwarf and runner beans, cucumbers, marrows, pumpkins, sweet corn, spinach, winter cabbage, kale, cauliflower, broccoli and salad crops.

—Wm. C. HYDE, Horticulturist.

Winter Crops and Half-Hardy Summer Crops

BEAN crops may be grown for use green in the pod or shelled or dry. For dry use the white, light green, and pale dun haricots are a popular nutritious vegetable available throughout the winter months. A light, rich, warm soil is most suitable for this crop, and where lime has been used a dressing of an ounce or two of superphosphate to the square yard will be beneficial. Sow thinly so that plants stand at intervals of three or four inches, and leave 2 ft. between the rows of dwarf varieties. Drills are made two or three inches deep, the latter being adopted where the land is light.

The runner bean, a different botanical species from the preceding, is a perennial plant grown for green use, and may be cropped for two or three years before resowing in a fresh place.

The soil required by the gourds should be rich in humus, moist, and well drained. Cucumbers may be sown to stand 12 to 18 inches apart and five to six feet between rows, and marrows and pumpkins three to four feet between plants, with a greater distance between rows for varieties with strong runners when planted on a rich soil. Marrows are best cut green for immediate use as soon as they are of sufficient size, and the pumpkins allowed to ripen off and stored for winter use.

Seed beds of cabbage and other plants of the same family will require close attention to keep them free from insect pests. Remnants of older crops of the same class should be cleaned up promptly, so that pests are not readily carried over to succeeding crops.

Sowings for October

Sowings for October consist of the half-hardy crops of dwarf and runner beans, marrows, pumpkins and cucumbers, and also the winter crops of savoy and red cabbage, kale, cauliflower and broccoli for planting out early in the new year. In districts where the season is not sufficiently long to grow an autumn-sown crop of red beet, a good main-crop sowing may now be made for winter use.

—Wm. C. HYDE, Horticulturist.

Kumeras

THE rooted shoots of kumera or sweet potato should be kept heeled-in closely in a sheltered bed, where they are readily protected with covers in severe weather. As soon as danger of frost is past they may be set out. This will be, in many instances, early in November, or even later, but it should be as soon as possible, as the crop requires a long season to give best results.

The soil most suitable for this crop is light, moderately rich, and clean. Where the quantity of manures or fertilisers used is small, it should be placed beneath the ridges on which the plants are set; larger dressings should be broadcasted and turned under.

Where there is a possibility of dry conditions prevailing, planting is best done on the flat, otherwise a low broad ridge will be warmest and give best results. Plants should be set 18 inches apart and two and a half to three feet between rows. Planting is best done after rain, but if the weather is dry the plants should be watered in.

Controlling Mushroom Parasites

WITH rising temperatures, especially where they reach over 60 deg. F, growers of mushroom crops may find difficulty in controlling insect pests. This will be found greater on the older establishments where a rigorous system of plant hygiene has not been observed, and especially when the crop is grown in sheds from which insects may not readily be excluded and where effective fumigation cannot be given.

The commoner pests are mushroom flies (Sciara), manure flies (Phoridae), and springtails (Collembola). Where the house may be closed tight these pests can be destroyed by fumigating with nicotine, half to one fluid ounce per 1000 cubic feet; otherwise nicotine sulphate, one ounce to four gallons water, may be used as a spray. It should be noted two ounces of lime hydrate should be used in the place of the usual soap ingredient, which is injurious to the mushroom crop. Another remedy is dusting with a pyrethrum powder of the highest grade.

These treatments destroy the insects, but not the larvae, and therefore should be repeated at intervals of two or three days, as may be necessary, to destroy the flies as they emerge.

Culinary and Dessert Fruits

THE tomato crop under glass will be setting the fruit, and the success of this critical period of development depends very largely on maintaining a suitable atmosphere. Cold draughts, close humid conditions, and sudden changes are inimical. When necessary, watering should be done in the morning. Excessively high or low temperatures should be anticipated, and the ventilators adjusted to maintain a warm buoyant atmosphere. In warm districts a little ventilation will be required now, even at night. Unless glasshouse crops are given this close attention they are not likely to prove profitable.

During October, chiefly towards the end, the first batch of tomato plants for outside cropping can be planted. They should be set deep and firm, carefully avoiding injury to the stem, the land being first well prepared. Spacing, whether stakes or trellis is used, should be from 12 to 15 inches between plants and three feet between rows.

Other half-hardy plants of this class which may be planted outside at this time are passion-fruit, tree-tomatoes, and Cape gooseberries, and also melons and cucumber plants which have been raised under glass. If they have been purchased or come from a distance it is advisable to place them in the hardening-off frames for a while to be sure of their condition before planting them out.

Peppers

Rather more tender than the plants mentioned are peppers and egg plants. These can be planted out a fortnight or so later, when there is practically no danger of a damaging frost. With the greater interest now being taken in salads and fruit by the general public, these crops demand greater attention from commercial growers with a rich, light soil in really warm districts.

The egg plant, probably a native of India, has long been in cultivation. It has much the same cultural requirements as the tomato, except that it is more tender and requires a rather longer growing season. For this reason it should be well advanced in growth before planting out; preferably it should be in a pot, so that transplanting will interfere with growth as little as possible. The most suitable spacing is 2 ft. apart and 3 ft. between rows.

Peppers, or Capsicums, require much the same attention as the preceeding, but may be planted rather closer, the plants being set 18 inches apart with 30 inches to 3 ft. between the rows. There are a large number of varieties, which may be roughly divided into those with fruit which is "hot" or pungent, as Tabasco and Cayenne, and others which are known as "cool," or sweet, and are in demand for serving as stuffed peppers and for use in salads.

Strawberries showing signs of a fair crop may now be given a dressing of nitrogeneous manure with advantage just before applying the mulch. For mulching clean baled straw which has been weathered to destroy seeds is very suitable; rushes and pine needles may be used where straw is unobtainable. To keep the berries free from grit thrown up by splashing rain something of this kind is desirable.

Pruning Flowering Shrubs

If flowering shrubs are studied it will be noticed that they flower best either on the old wood or the young wood—that is, one-year-old wood or the new season's wood. On this fact the pruning treatment required chiefly depends.

Early-flowering shrubs of importance which carry their blossom on the young wood, such as forsythias, lilacs, double-flowering peaches, banksia rose, acacia, etc., are greatly benefited by cutting away the wood as soon as flowering is over to admit the light and air which are so necessary to the young growth that follows and is to flower next season.

Suckers should also be suppressed, as they represent so much wasted energy, and they, too, interfere in the development of legitimate growth. For the same reason all rank, superfluous growth which is inclined to crowd the plants should be suppressed.

Rhododendrons rarely make sufficient growth to require much pruning, but it is well worth while removing the seed pods from heavy-flowering varieties as soon as the petals have fallen.

—Wm. C. HYDE, Horticulturist.

Summer Bedding Plants

AS the time is arriving for setting out summer bedding plants, some preparation should be made. The fragrant stocks, the glowing zinnias, and

(Continued on page 260.)

APIARY NOTES

Contributed by Officers of the Horticulture Division

Inspection of Hives

BEE-KEEPERS throughout New Zealand welcome September as being our first spring month. It is during this period that they are usually able to give the first complete overhaul of the bees. September can usually be relied upon to give at least ten days of good weather. Sometimes this occurs early in the month, and at other times towards the end.

Every advantage should be taken of warm, fine days to make a thorough inspection of each hive in the apiary. This examination need not be so hurried as those made the previous month, and more detailed attention can be given to each individual colony. This at least may be done in most districts where there is an early flow of nectar and pollen available. In localities where there is a scarcity, every care must be taken to avoid allowing any robbing to occur. If there is any evidence of robbing the hives should be closed down as soon as possible and the detailed inspection postponed until a more favourable opportunity occurs.

Stores First.

Where a brief examination, as suggested in last month's notes, has been given, the bee-keeper should first consult his notes to see whether any particular hive has been marked for attention, such as requiring stores, or no brood or eggs in evidence. Attention should first be given to those requiring stores. Where spare combs of honey are held in reserve for providing stores it will be a simple matter to remove one or two frames of empty combs and replace them with frames of honey. If no such frames are available sugar feeding will have to be resorted to.

There are many different methods of feeding sugar to bees, and the beginner should remember that only white sugar should be used. To use brown sugar is to subject the bees to the danger of dysentery. Another point to remember is that all feeding should be done inside the hives. To feed, as many novices do, by placing the syrup in front of the hives is to cause disaster immediately by tempting other bees to rob out the hive being fed.

Perhaps the best and simplest method for inexperienced bee-keepers is to purchase a "division board feeder." This is usually made of three-ply wood, and fits into the hive like a hive frame. It will hold about two pints of syrup. If this feeder is placed at the inside next to the wall of the hive it can be easily refilled without unduly disturbing the bees. Two frames of empty combs can first be removed to make room for the feeder.

All feeding should be done in the evening when the bees have quietened down, and every care must be taken to avoid spilling any of the syrup where the bees can gain access to it.

In cases where the sugar-feeding is to replace depleted stores the strength of the sugar syrup should be about two parts of sugar to one of water.

Stimulating Feeding.

If, however, the object is to stimulate brood-rearing in order to build up the colonies to full strength, the proportion should be one of sugar to two or three of water. It should be noted, however, that for stimulative purposes the feeding should be done in small quantities and maintained regularly for a week or two, or until nectar is coming in freely.

Queenless Colonies.

During the present examination any hives which have been marked "doubtful" in regard to brood or queen should be further examined to ascertain the position in this respect. Should there still be no signs of brood or eggs, the hive should at once be united to a hive containing a laying queen, that is, if there are sufficient worker bees in the hive to be worth saving.

Drone-laying Queens.

Another matter which often causes perplexity to beginners is where a queen turns out to be a "drone-layer." It sometimes occurs that a queen when she is ageing fails to lay fertilised eggs, but continues to lay eggs which all hatch out drones. In such cases the colony is not worth saving unless the fault is found before most of the worker bees are dead.

If the hive is weak, or practically all drones, it would be best to destroy it and save the combs for other hives. If, however, there are a fair number of worker bees present, and if a good queen can be procured, the faulty queen may be found and destroyed and a new queen be given.

Culling the Combs.

While the hives are under examination any defective combs should be removed as soon as the honey is consumed. It often occurs that some combs become broken or stretched and that the bees have built a proportion of drone comb in them. This condition is not desirable, especially if they are in the brood chambers, for in such cases there would be an unnecessary number of drones reared. As the drones are heavy consumers and non-producers this is not an economical proposition for honey production.

If any such combs are found not yet free from honey they can be removed

from the brood chamber and placed in a super over the mat. If a corner of the mat is turned back to allow the bees access to them they will, in a few days, be found empty, when they can be removed and either melted down for wax or reconditioned by cutting out the drone comb and placing in the gap a piece of worker comb corresponding in size and shape. This patch can be kept in position by placing a couple of rubber rings around the frame. It often happens that two good combs can be made from three bad ones. If this can be done it will save both foundation wax and the time required to draw it out into combs.

Watch for Disease.

Experienced bee-keepers, perhaps almost unconsciously, have acquired the habit of always looking for disease whenever frames containing brood are handled. This habit was caused by the conditions prevailing some years ago when the disease "foulbrood" was more often in evidence than colonies free from disease. Because of education and constant vigilance, however, the position is now reversed, and in commercial apiaries the finding of foulbrood is rare, except in a few isolated cases.

Beginners should also acquire this habit of always noting the condition of the brood whenever a frame is handled, and should become acquainted with the symptoms of this disease and the best methods of dealing with it when found.

Briefly, foulbrood is caused by bacillus larvae, which attack bees in the brood or larval stage. The infected larvae usually die just after the cells are capped over. In a few days the cappings over the cells containing this dead larvae become slightly sunken and appear somewhat darker in colour than the healthy surrounding cells, but this condition alone is not conclusive evidence of foulbrood.

Diagnosis.

If a suspected cell is opened and a thin coffee-coloured mass is noticed on the lower part of the cell and a wooden match or straw is inserted to attempt to remove it, it will be found in the case of disease that the substance will adhere to the match and rope out for half an inch or more. This is considered conclusive evidence of disease. When such is discovered the hive should be closed down at once and marked for future treatment. Care should be taken to burn the match used in diagnosing the disease.

The method of treatment is fully explained in the bee bulletin referred to in last month's notes, or a leaflet on foulbrood can be obtained from any office of the Department of Agriculture. The beginner would be wise, however, in getting in touch with the Apiary Instructor for his district and obtaining expert advice. He will be able to advise what steps should be taken.

Among bee-keepers of long experience the opinion is now held that the cheapest and safest method of dealing with this disease is to burn the bees, hive and contents. This method is worthy of being adopted by all bee-keepers.

—*G. V. WESTBROOKE, Apiary Instructor, Hastings.*

Efficient Method of Straining Honey

C. R. PATERSON, Apiary Instructor, Greymouth.

THE straining of honey has been the source of considerable worry to many bee-keepers during the busy extracting season. This applies mainly to the small bee-keeper who has to be content with the minimum amount of equipment. The bee-keeper working on a commercial scale very soon realises the necessity of suitable equipment to strain effectively and efficiently the large quantities of honey extracted during a season. This is necessary to allow his whole plant to run smoothly and not to be subject to the irritating delays caused by a hold-up in the straining system.

It must always be remembered that honey should reach the market in the very best possible condition. Unfortunately, it was not uncommon in the past to find honey exposed for sale where proper care and attention had not been given to the straining of the honey at extracting time. I think that in many cases this was not due to carelessness on the part of the bee-keeper, but to the inefficient straining methods adopted.

Strainers Commonly Used.

It is well known that as the honey comes direct from the honey extractor it contains numerous particles of wax and pollen grains. This honey is sometimes placed direct into the settling tank and allowed several days for all the refuse to rise to the top, when it is carefully skimmed off. This method is not to be recommended, as the honey still contains many very fine particles of wax, etc., which takes a considerable time to rise to the surface. Warming the honey certainly improves the efficiency of this method.

The two principal strainers used by the smaller bee-keeper are the cheesecloth bag and the Alexander wire-gauze bucket. These strainers are quite efficient to a limited extent under certain conditions, but where honey is put through them direct from the extractor they very soon become clogged up with wax, etc. This immediately slows up the work of extracting, as the strainers will not take the honey as fast as it is extracted.

In desperation the bee-keeper will resort to scraping the inside of the cloth or wire gauze with a spoon in an endeavour to expedite matters. Unfortunately this causes many fine particles to be forced through with the honey, and they come to the surface only after the honey is packed into the different-sized containers. This accumulation of pollen and scum immediately destroys the attractiveness of any packed line.

The efficiency of these two strainers can be much improved by allowing them to be immersed in the honey, as shown in the sketch (1). This allows

the extraneous matter to float on the top of the honey on the inside of the strainer, thus allowing the honey to filter through the sides.

Combined Warming and Straining System.

Because of the fact that wax, pollen, and any extraneous matter readily floats on the surface of the honey, it has been possible to evolve a system by which the extractor can work continuously without any undue hold-up caused by blockage in the strainer.

Sketch 2 illustrates a simple and inexpensive arrangement which will effectively deal with all the honey from a small extractor. For a larger extractor it would be necessary to increase the size of the equipment in proportion to the extra volume of honey being handled.

Description.

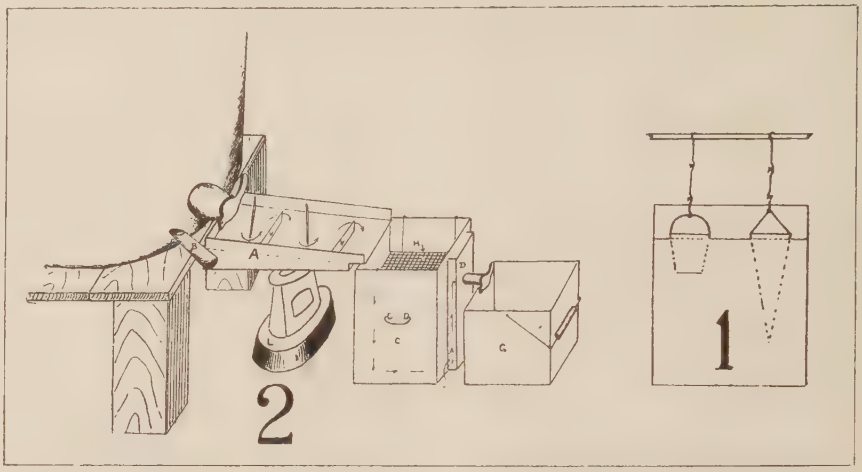
The extractor E needs to be placed on a firm stand at a suitable height to allow the honey to gravitate through the whole system into the can G. The amount of honey flowing over the heater element can be controlled by the gate on the extractor. The heating element A is best made out of tinned sheet copper, and has a water jacket underneath with an outlet at B. The vanes V are soldered on to the heater element in order to cause the honey to travel a greater distance over the heated surface.

The lamp L is used for supplying the necessary heat, but where a steam-heated knife is used the exhaust steam pipe could be placed in the opening B. The gravity strainer C in its smallest size could be made from a clean 60lb. honey tin, with the channel D soldered on the outside. It is necessary to cut an opening at F large enough to cope with the maximum flow of honey; otherwise there is a risk of the honey accumulating and overflowing in the tank C.

The coarse screen H is handy for removing the accumulation of wax, etc., at the end of the day. The can G is used for carrying the honey to the main honey tank, where it is finally put through a fine cheese-cloth to catch the few very fine specks that have been carried through C with the flow of honey.

Principle of the Method.

As the honey comes from the extractor it flows over the heated element A, as shown by the arrows, thus reducing its viscosity and readily allowing all extraneous matter to rise to the surface as the honey enters the tank C. The honey then has to rise to the level D before it can run out of the gate into can G. As the warmed honey keeps coming into C the clarified honey follows the direction of the arrows, while the wax, etc., accumulates above the grid H.



At the end of the day the honey remaining in C can be removed by tilting the tank and allowing the honey to run out at D, or, if extracting is to be carried on on the following day, just remove the accumulation of wax. An efficient method of honey straining will very soon reflect in the quality of the honey packed by the bee-keeper and the increased popularity of his particular pack.

VEGETABLES, SMALL FRUITS AND FLOWERS

(*Continued from page 257.*)

the delicately-coloured asters each have their appeal, and provide wholesome pleasure when well grown. This is best attained by strictly limiting the area planted and doing it well.

The foreground of the shrubbery border, so often used, is rarely suitable, as the interests of the respective crops often seriously clash. As the name bedding-plants indicates, they are best grown in beds or borders specially set aside for the purpose, so that the proper treatment may be given. With the continuous cropping these receive there is a danger of their becoming deficient in humus, without which good results cannot be obtained.

It may be supplied now by turning in a good supply of decayed farm manure. If three or four ounces of bonedust to the square yard is included, success should be assured if good plants are set out in a tasteful manner. An ounce or two of superphosphate to the square yard hoed in shortly before planting would supply their more immediate need for phosphates.

Good Plants

Good plants are dwarf, bushy, and well rooted. It is important, too, they should be well hardened-off and not suddenly transferred from the glass-house or hot bed, which would cause them to become stunted in their growth.

The "planting season" during which hard-wooded plants generally can be transplanted satisfactorily is now drawing to a close. Where new planting of this kind has been done it will be sufficient to suppress the growth of weeds and grass in the vicinity that might rob the young plant of its requirements of light and air, and, should the season or locality be dry, a mulch of stable manure or humus about each plant will be of assistance in retaining moisture.

—*Wm. C. HYDE, Horticulturist, Wellington.*

Notes for the Poultry Farmer

Contributed by Officers of the Livestock Division

Breeding and Rearing Ducks

WHILE ducklings may be hatched later than chickens, it is advisable not to leave them too late if the best results are to be obtained. When selecting breeding ducks the same care and attention should be exercised as is given to the selecting of any other breeding birds. Firstly, purity of blood, and then vigour and constitution, are essential characteristics which must be given every consideration. Physical activity is the outstanding indication of vigour and constitution.

If egg production is the chief object a selection should be made of those birds which possess large, bold, prominent eyes set high up in the head, for it is seldom that ducks with eyes set low down in the side of the face are good producers. The neck should be fairly fine, and the body a good length, with width across the back.

Two-year-old ducks mated to well matured drakes at least ten months old should give good results. Generally speaking, from six to seven ducks to each drake of the Indian Runner and Khaki Campbell breeds and four to five ducks to each drake of the heavy breeds should give good fertility.

Incubation Period

Muscovey duck eggs take from 35 to 37 days to hatch, and duck eggs of other breeds 28 days, although many eggs chip about the 26th day. Eggs for hatching should be selected with care, and only those of good shape, colour, size, and texture of shell should be set. As duck eggs do not keep as well and lose their fertility more quickly than hen eggs, they should be set as soon after being laid as possible—within a week if possible.

When hens are used for hatching purposes it will be found that from nine to eleven eggs will be sufficient to place under each hen. Better results will usually be obtained if hens are set on the ground, and if the weather is dry it is advisable to sprinkle the eggs and dampen the ground around the nest every second day during the last week of incubation, but care should

A useful ideal of Utility Black Orpington rooster.

be taken not to overdo this sprinkling, especially during damp weather.

Artificial Incubation

As a rule, duck eggs require a little less heat and ventilation during the first week and more ventilation and moisture during the last week of incubation than that allowed when hatching hen eggs. A temperature of 102 deg. F. for the first week, 103 deg. F. for the remainder of the period, and 104 deg. F (not higher) when they start to chip has given good results. It is a good practice to spray the eggs once each day during the last 10 days with a little warm water (about 103 deg. F.). This may be done with the mouth or with a small brush. Care should be taken to see that the eggs are not chilled when spraying. If the eggs are cooled at night, then spray in the morning or vice versa.

Ventilation is very important, and it is not possible to state how much is required with each machine in all districts. However, it may be said that after the first 10 days the ventilators may be gradually opened, and once the eggs begin to chip the ventilators may be opened wide.

Brooding Ducklings

Provided ducklings are brooded in dry, clean, well-ventilated, and warm sleeping quarters, they are not difficult to rear, but they must have the conditions mentioned.

Many young ducklings are lost each year, and the first unfavourable symptoms noticed are watery or sticky eyes. The trouble is usually the result of the ammonia from damp, dirty bedding material and from want of proper ventilation in the brooders.

Again, many are lost from blind staggers, a condition which is usually caused by giving the ducklings a drink and a feed at the same time after they have been too long without water. If it is found that their drinking vessels are empty at feeding time it is better to give them a drink before feeding, and if the morning is cold it is advisable to take the chill off the water.

Ducklings do not require artificial heat for as long a period as chickens, but they need much the same treatment as chickens at first. However, as previously mentioned, they must be provided with clean, dry bedding material and well-ventilated sleeping quarters.

Gets
150 EXTRA
EGGS A WEEK

—7,808 ADDITIONAL EGGS A YEAR — *Amazing increase in yield from 200 KARSWOOD-fed birds!*

Can Karswood Poultry Spice increase YOUR egg-production, without detriment to your birds, and at the same time net you £'s extra profit per bird per year? The answer, clear and unmistakable, is given in the letter below.

The poultry-keeper in question had 400 hens, which he separated into two pens of 200 birds each. To one pen he gave Karswood Poultry Spice; to the other no Karswood Poultry Spice. The Karswood-fed birds laid 29,432 eggs in 12 months; the others 21,624 eggs. In other words, Karswood produced 7808 MORE eggs over the period. which equals 150 extra eggs per week of the 52 weeks. **The extra cost per hen per day was only one-fifth of a farthing or 5/10 per week to secure 150 additional eggs. Why lose further time? With the heavy demand for eggs during the coming Exhibition period there is no finer investment than Karswood Poultry Spice for ANY poultry-keeper.**

"Two hundred of my hens which have had Karswood Poultry Spice regularly have averaged 147 eggs per bird per year as against 108 eggs per bird per year from another lot of 200 which have not had Karswood Poultry Spice.

"I with pleasure send the monthly egg totals from the two lots of hens, 200 in each lot, running on free range:—

200 Hens WITHOUT Karswood.

	Eggs.		Eggs.
July	1268	January ...	1858
August	1748	February ..	1916
September .	3410	March	1620
October ...	3696	April	760
November .	2808	May	358
December .	1654	June	528

Total: 21,624 eggs, average 108 eggs per bird per year.

200 Hens WITH Karswood.

	Eggs.		Eggs.
July	2364	January ...	1763
August	3850	February ..	2367
September .	3812	March	1910
October ...	4721	April	980
November .	3905	May	764
December .	1692	June	1304

Total: 29,432 eggs, average 147 eggs per bird per year.

"This, I think, is enough to convince anybody of the value of your excellent Karswood Poultry Spice, which, I assure you, I shall continue to use as long as I keep poultry."—D.S. (Original letter on file for inspection.)

KARSWOOD
POULTRY SPICE

Increases egg-production without forcing, because it contains ground insects, but no cayenne pepper, &c.

A useful ideal of Utility Black Orpington hen.

Feeding Ducklings

As in the case of chickens, there are many different methods of feeding ducklings. The following has been used with success:—

The first feed after the ducklings have been placed under the brooder consists of a mixture of equal parts of pollard and bran, with a little rolled oats, plus 5 per cent. of sand or oyster shell dust. Mix to a crumbly state with skim milk. This is fed four times a day for the first five days. For the next five days add about 5 per cent. of meatmeal or animal food and a small quantity of finely cut succulent green feed. After about 10 days the animal feed may be increased to 10 per cent. Also, increase the quantity of green feed.

From about two weeks old, three green feeds per day will be sufficient. Never allow the feed to become sour, but give as much as they will clean up. It is not necessary to add sand to the mash after the first week, but it is necessary that fine oyster shell and gravel grit be available to the birds at all times. It is advisable, also, to remember that ducklings should have plenty of shade from the sun. Ducklings and chickens should be reared in separate houses and yards.

It is a practice with many large poultry-keepers to sell all breeding males each season as soon as the required number of eggs for hatching have been collected, and to rear a fresh lot of cockerels to head their breeding pens the following season.

No doubt cockerels are more fertile early in the season, but it is suggested that if the poultry-keeper has an outstanding male which has given good results and stood up to his work well, such a bird should be retained and mated to a few selected hens for producing cockerels next season instead of being sold for a few pence. A good prepotent male is a wonderful asset on any plant. They are rare and difficult to breed, and the very best use should be made of such birds.

Grading Up Growing Stock

With almost every lot of brooder chicks there will be found some that do better than others and some that do not seem to thrive quite as well as the majority. It is a good plan to grade up the growing stock periodically, and for this reason it is sound economy to have an extra brooder on the plant so that a regular grading-up system may be adopted.

Above all, beginners are advised not to endeavour to rear more birds than they have accommodation for. Some are anxious to build up their flock too quickly, and unfortunately, very often, it is not until severe losses have been experienced from colds, roup, or even coccidiosis, that the great danger of overcrowding is fully realised.

It is advisable, however, to remember that it always pays best to give the extra room, time, and attention to a suitable number, and to see that the chickens are hatched as near the correct time as possible.

C. J. C. CUSSEN, *Chief Poultry Instructor, Wellington.*

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"THE PINES"

N.Z. Federation of Young Farmers' Clubs

Edited by S. Freeman, Dominion Organizing Secretary

President's Annual Report

Progress Indicated by Increased Membership and Activities

Annual report presented at the fifth annual meeting held in Wellington on July 14, 1939, by the president, Mr. Alan Grant.

I HAVE pleasure in reporting that very definite progress has been made in the Young Farmers' Clubs movement during the past year. It is very satisfactory to note that not only is the progress indicated by additional clubs and increased membership, but also by the activities that have been successfully carried out throughout the whole movement.

The organisation now embraces practically every farming district in New Zealand, and there can be no doubt in the minds of those associated with the movement as to its national value. The activities carried out by the clubs are encouraging the members to take a greater interest in their life work, and assisting them to improve their outlook and also their environment.

The movement is seeking out the leaders from among them, giving them confidence in their own ability, and generally exercising a wonderful influence on country life. It is also pleasing to note the spirit of loyalty to their own organisation that is becoming engendered, and this will undoubtedly secure the successful continuation of the movement in the future.

Over 5000 Members

Figures quoted at the last annual meeting revealed a total of 160 clubs affiliated to the federation, comprising 67 in the South Island and 93 in the North Island. Today there are 201 clubs, of which 75 are in the South Island and 126 in the North Island. The increase of 41 clubs has resulted in the total membership being raised to well over 5000.

Actually, 50 new clubs were formed during the period, but it became necessary to disband nine of the older clubs because of insufficient attendance, resulting in most cases from young men leaving the district. In some cases the remaining members have joined up with neighbouring clubs, and in others it has been found expedient to amalgamate two weak clubs to form one good club.

A comparison between the situation of the clubs last year and this is of interest:—

Council area—	1937-38.	To date.	Increase.
Otago-Southland ..	33	35	2
Canterbury	34	40	6
Wellington	63	80	17
Auckland	30	46	16

Taking the position as a whole throughout the Dominion, it cannot be reasonably expected that a great many more new clubs will be formed. While there is still scope in some districts for further organisation, it would appear that in many districts the general endeavour should be in the direction of increased membership and a widening of club interest. A general consolidation of the whole movement is to be desired, and a move towards the strengthening of individual clubs and the further co-ordination of the work of the councils and district committees would be of great value to the organisation.

New Constitution

The alterations to the Y.F.C. constitution, brought into effect just before the period under review, would appear to have been justified. The general effect has been to give greater proportionate representation by active members on the various committees, etc., and the four councils, set up in place of the two Island Councils, have done very valuable work.

The district committees have in many cases realised their responsibilities, assisting clubs with their programmes and stimulating interest by organising district activities. Much of the success of the movement depends upon the proper functioning of the district committees, and the necessity of these committees holding regular meetings in order to maintain close contact with the clubs under their jurisdiction must be stressed.

A far-reaching decision was made at the last annual meeting when the age limit was raised from 25 to 30 years. This has certainly stimulated membership, but, as has been pointed out frequently to clubs and to members, there is the danger of the discouragement of recruiting from the younger lads. However, this aspect has been given attention to by most districts, and wherever possible the younger members are being encouraged, and competitive activities are being arranged in junior and senior sections. If care is exercised in this respect the raising of the age-limit will doubtless prove, in the long run, to be a wise move.

Monthly Notes

Advantage has been taken of the Department of Agriculture's service in the distribution of the "Journal of Agriculture" direct to individual members. At the last annual meeting the club membership fee was raised from 2s 6d to 3s 6d, the extra 1s including the annual subscription (post free) to the "Journal," thus bringing in every member as a subscriber at the concession rate.

The Y.F.C. Section in the "Journal" has been maintained and has contained some excellent contributions by club members themselves. The publication of the "Among the Clubs" section, giving a detailed resume of the work carried out monthly by the various clubs,

and also the accounts of the main activities undertaken at the different centres, has assisted greatly in the stimulation of club work generally, the spirit of emulation being largely responsible.

Lectures still play an important part at club meetings, officers of the Department of Agriculture, members of the staffs of the Agricultural Colleges and Institutes, farmers, breeders, and others having assisted. Impromptu speaking and debating have come very much to the fore during the year, and inter-club and district debates have been conducted freely throughout the Dominion. A number of trophies have been made available locally to stimulate this valuable work, and a start has been made with inter-district contests leading up to interprovincial debates.

Field Days

Club and district field days and demonstrations have done much to instruct members in the many phases of agricultural and pastoral work, and have also assisted in giving publicity to the movement. Stock-judging competitions have become a regular feature in most districts, and a start has been made also towards interprovincial competitions. Hay and sheaf stacking competitions have also been successfully carried out in some districts.

The A. and P. Associations throughout the Dominion have encouraged clubs and members by scheduling special classes for Y.F.C. members at the local shows, and also by allowing members to act as junior stewards and associate judges where practicable. At least one club has staged its own stock show, which proved to be a most successful undertaking. Both the club and district activities have also included a number of social, recreational and sporting events, which have done much towards popularising the movement and holding it together.

It is of interest to note also that regular Y.F.C. sessions now form part of the programmes of the principal radio broadcasting stations of the Dominion, many of the talks and lecturettes being prepared by clubs and delivered by the members themselves.

Major Activities

Major activities have included a very successful national shearing competition staged at Palmerston North during the Spring Show, nearly 100 competitors from all over New Zealand taking part. Educational weeks or courses were held in Dunedin, Hastings, Wanganui, and Gore, these undertakings bringing together members from over wide areas. Successful tours were also undertaken, prominent among them being a tour by a party of North Taranaki members through the North Island, a combined Otago-Southland party touring the lower part of the North Island, a Manawatu party touring Marlborough, Nelson, and Westland, a combined Marlborough-Nelson party touring Otago and Southland, and a Wairarapa party touring the West Coast and Canterbury. Other minor tours also took place.

The tours proved popular, giving members the opportunity to broaden their outlook and to view farming practices under conditions different from their own. A party of more than 30 members from the South Taranaki district have recently returned from a tour of New South Wales, and it is understood that those taking part enjoyed a very interesting and instructive trip.

The review of the year's work indicates a gradual widening of the scope of the activities of the clubs and of the movement generally. The fact should not be lost sight of that the major objective of the Young Farmers' Clubs should be the raising of the standard of agriculture throughout the Dominion by every possible means. At the same time, the development of the social and recreational side is well worthy of encouragement, particularly as a means of popularising the clubs and assisting in the improvement of the rural environment. If the movement succeeds only partially in arresting the drift from the country to the town, then it will have more than justified its existence.

Appreciation

In conclusion, I wish, on behalf of the federation, to thank the Minister of Agriculture, Hon. W. Lee Martin, for the keen interest that he has taken in the affairs of the Young Farmers' Clubs, and for his assistance through the Government by way of a substantial grant towards the funds of the federation. I also wish to thank the Department of Agriculture and its individual officers, who have provided the organisation which has made possible the successful carrying on of the Y.F.C. movement. I also wish to acknowledge the assistance rendered to the clubs and to the whole organisation by the New Zealand Farmers' Union, the A. and P. Societies, breed societies, agricultural colleges, research institutions, and the Women's Division of the Farmers' Union, and to thank all others, both within and outside of the organisation, who by their assistance have contributed to the progress of the Y.F.C. movement during the past year.

The Y.F.C. movement in New Zealand has come to stay, and I am satisfied that it is progressing along the right lines. The regard in which the members, the clubs, and the organisation generally is held by all sections of the community is in itself a tribute to the high aims and objects of the movement, and is very definite evidence of its national value.

(Signed) ALAN GRANT,
President.

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Report of Annual Meeting

Decisions for Future Activities

MORE than forty delegates from widespread parts of the Dominion, the majority of them being active club members, attended the annual meeting of the New Zealand Federation of Young Farmers' Clubs in Wellington on July 14.

The meeting was opened by the Minister of Agriculture, the Hon. W. Lee Martin, who referred to the progress of the Y.F.C. organisation in New Zealand and its value to the farming community and to the Dominion as a whole. He assured the delegates of the good wishes of the Government, and promised to do all within his power to assist and further the movement.

Mr. E. W. Barnett, chairman of the Wellington Council, replying to the Minister on behalf of the federation, referred to the organisation provided by the Department of Agriculture, and thanked the Minister for his good wishes and for the assistance already given by the Government.

After the adoption of the annual report and balance-sheet the election of officers took place. Mr. E. W. Barnett was elected president for the ensuing year, and Mr. D. F. Coleman (chairman of the Canterbury Council) was elected vice-president. Both Mr. Barnett and Mr. Coleman are active club members. The retiring president, Mr. Alan Grant, referred to some of the difficulties still to be overcome in connection with club work and organisation, and made several suggestions for maintaining interest in the movement.

Meeting's Decisions

Some of the more important of the decisions made at the meeting are as follow:—

The constitution is to be brought up to date in accordance with the recommendations of the Dominion Executive Committee. The revised constitution will be printed in booklet form and issued at a charge of 6d per copy to defray cost.

The question of centennial tree-planting is to be left to the district committees, under the direction of their councils, to formulate their own plans to carry out the general scheme. The councils are to report to the special committee relative to the recommendations within their respective areas, the whole to be incorporated in the general scheme.

Mr. C. J. Hamblyn, in consultation with various livestock judges, had elaborated a system of stock-judging which had the approval of the Dominion Executive Committee. It was recommended that this system be tried out in an endeavour to secure uniformity of Y.F.C. stock-judging throughout the Dominion. It was decided to adopt the recommendation, and Mr. Hamblyn was thanked for his useful work.

A special committee was set up to co-ordinate rules of debate and the running of contests throughout the four councils.

Centennial Exhibition

A camp is to be held in Wellington during the Centennial Exhibition period to enable members to visit the exhibition. Invitations will be extended to overseas Y.F.C. delegates, from Australia, the United Kingdom, Canada, and South Africa, the total number to be limited to twenty. The visitors will be conducted over both islands during their stay, and it is expected that hospitality will be provided by the organisation throughout the Dominion.

Land Settlement

Considerable discussion took place on land settlement subjects, and it was decided to request the councils to consider urgently the question of land settlement for young farmers, and to endeavour to formulate definite schemes, the chairman of each council to report to the Dominion Executive Committee at the first opportunity.

Interesting discussions took place regarding national defence, Y.F.C. tours, educational weeks and camps, scholarships, the insurance of trophies, etc. A feature of the meeting was the able manner in which the active club members took part in discussion, demonstrating their ability to conduct their own business without undue assistance from the advisory members, and their obvious confidence demonstrated at least one aspect of the value of the Y.F.C. movement.

Members interested in further details of the meeting can obtain the minutes from their club secretaries, to whom copies have been forwarded.

New President

Mr. E. W. Barnett

Mr. E. W. Barnett, Tokorangi, Halcombe, has been associated with the Y.F.C. movement since its inception in the Manawatu. He became advisory president of the Halcombe Club on its

MR. E. W. BARNETT

formation in July, 1936, and later, when (largely due to his efforts) the age limit was raised to 30 years, he became an active member and chairman of the club. Since then, after two years as vice-chairman of the Manawatu District Committee, Mr. Barnett has been elected district chairman, and at the last meeting of the Wellington council he was appointed council chairman. This year Mr. Barnett holds the four positions within the movement—club chairman, district chairman, council chairman, and Dominion president.

Mr. Barnett was educated at the Palmerston North Boys' High School and Wanganui Collegiate School, after which he took up farming at Halcombe, where, among other interests, he has established Southdown and Polled Hereford studs. He was for two years vice-president of the Wellington Provincial Executive of the New Zealand

Farmers' Union. He is at present chairman of the Western District Council of the Royal Agricultural Society, a member of the council of the Royal Agricultural Society, a vice-president of the Marton A. and P. Association, vice-president of the Manawatu and West Coast A. and P. Association, a member of the committee of the Feilding Industrial A. and P. Association, a member of the council of the N.Z. Hereford Breeders' Association.

He is also on the committees of the N.Z. Sheepowners' Federation, the Manawatu Boys' and Girls' Agricultural Clubs, the Feilding branch of the Wellington Acclimatisation Society (being also a member of the Wellington Council of the society). He is a member of the Manawatu-Oroua School Committees' Association (Inc.), and a past member of the Dominion Executive of the N.Z. Federation of School Committees, chairman of the Halcombe branch of the N.Z. Health Camps, and a member of the Manawatu executive of the same organisation.

For about seven years Mr. Barnett has been keenly interested in aviation, and has held a pilot's licence during the period, being vice-president of the Manawatu Aero Club and president of the Feilding Aero Club.

Mr. Barnett is on the official judges list for fat stock, Southdowns, and Herefords, and will be judging the Hereford cattle at this year's Royal Show at Invercargill.

Dunedin Educational Week Held Amid Heavy Snow

S. R. WHYTE, Hon. Secretary, Otago and Southland Council.

PROBABLY no educational work, and certainly none of those previously organised, has had the same wintry opening as that recently held in Dunedin. Snow was falling fast as the course opened, and before next morning the city lay under snow varying in depth from one foot to two feet and remained so throughout the week. However, with few exceptions, 85 lads from South Canterbury, Otago, and Southland turned out to all sessions, and appeared to enjoy the experience thoroughly.

In Dunedin we are particularly fortunate in the good feeling which exists among the business people towards the country folk. This was exemplified by the fact that in addition to the Mayor, Mr. A. H. Allen, representatives of city organisations were on the stage to take part in the welcome. Mr. A. C. Cameron, Chairman of the Otago and Southland Council of the Federation, who again organised the week, was chairman at this and at all the other functions in connection with the course.

Also present at the opening were Messrs. J. W. Woodcock, Fields Superintendent at Dunedin, and S. H. Saxby, Instructor in Agriculture and secretary of the Dunedin District Committee.

One-Minute Speeches

The one-minute speeches which are a feature of the course showed that even lads who were not used to expressing themselves in public made a good showing in describing their districts and the type of farming in which they were engaged. Supper concluded the first meeting.

Members attending the Dunedin educational week photographed in the snow. Seated seventh from the left are S. R. Whyte (Hon. Secretary), A. C. Cameron (Chairman of the Otago and Southland Council), and S. Freeman (Organising Secretary).

[E. A. Phillips, photo.

It was noticeable that the usual good type of lad had been selected to represent the various districts. Branches of the Women's Division and of the Farmers' Union are always asked to assist in choosing representatives to attend the course, and it is obvious that in carrying out their task they do so with a sense of responsibility, as it is seldom that the lads are not absolutely worthy of selection. One must, therefore, on behalf of the organiser and of the Otago and Southland Council, thank the Women's Division and Farmers' Union members for their efforts.

As the snow caused a dislocation of all transport visits to such places as the Art Gallery had to be abandoned, but there was a commendable spirit of loyalty on the part of the lads in endeavouring to be present at all sessions.

Mr. A. C. Cameron had arranged a programme that was truly educational and cultural and at the same time provided plenty of variety. Education in visits to such plants as Messrs. Ross and Glendining's woollen mills and the Hillside railway workshops must tend towards giving these lads a broader idea of the city dweller's viewpoint.

An interesting session, "The Development of Modern Business," was introduced by Mr. A. C. Cameron, and was followed by a demonstration of modern office equipment.

Lectures

Culture came from lecturers, each of whom was well qualified to speak on his particular subject, and the following addresses were much enjoyed:—"Citizenship" (Mr. P. O. Smellie); "Propaganda" (Mr. D. S. Chisholm, M.A.); "The New Zealand Citizen and the Empire" (Dr. J. R. Elder, C.M.G., Professor of History, Otago University); "The Influence of Sheep Farming upon the Exploration of Otago" (Mr. W. G. McClymont, M.A.); "Shakespeare" (Mr. W. R. Brugh); ;"The Museum in Relation to the Country" (Dr. H. D. Skinner, Curator of Otago University Museum); "Defence" (Major O. L. Ferens).

Mr. H. Ninnis, Director of Station 4YA and a member of the Shackleton Antarctic Expedition, was unable to keep his original appointment to speak on "Dogs" as he led the party which went to the relief of the transmitting station staffs of Station 4YA and 4ZB on the Otago Peninsula, who were completely snowbound and whose provisions were running low. However, Mr. Ninnis eventually spoke on the last afternoon of the course.

The party were the guests of the Otago Provincial Council at the pictures on the Wednesday evening and at the Dunedin community sing, where a donation to the funds was made by a representative group of lads.

Value of Clubs

The opportunity was also taken at one of the sessions to stress the value of Young Farmers' Clubs, and Mr. S. Freeman, Organising Secretary, described the work of the movement elsewhere in New Zealand. The other speakers were Messrs. A. C. Cameron, J. W. Woodcock, and S. H. Saxby.

The only visit which had to be cancelled was that to the King Edward Technical College. As the school had to close because of snow, the lads were not able to see the work being done there or to hear the musical lecture by Dr. Vernon Griffiths.

However, the snow, with all its difficulties, rather added a touch of novelty, and must have helped to impress on the minds of every lad the seventh Dunedin educational week.

This report would not be complete without an expression of thanks to the management of the industrial plants visited, to the speakers, to the Dunedin Chamber of Commerce for the use of their board room, and to the Otago Farmers' Union Mutual Fire Insurance Association for the tea and scones provided every morning.

Kimbolton — Kiwitea Y.F.C. Annual Dance

R. H. THEVENARD, Kimbolton-Kiwitea Club.

VOTED by all as the best yet, the annual dance of the Kimbolton-Kiwitea Club, held in the Kiwitea Hall, went with a swing from start to finish. Visitors from surrounding clubs, including Halcombe, Apiti, Pohangina, Waituna, Bunnythorpe, Kairanga, and Feilding, combined with local club members and friends to fill the hall and to ensure the complete success of the dance. Messrs. Rich Thevenard and Stewart Craine were M.C.s.

The excellent supper, which was provided by the local members of the W.D.F.U., to whom the club's most grateful thanks are recorded, contributed to the success of the evening.

After supper the club chairman, Mr. H. Beard, welcomed the visitors, and gave an outline of the objects of the Young Farmers movement, among which, he said, the holding of these socials played a part in club activities and helped to make country life more attractive. He also thanked the members of the W.D.F.U. for their generous help.

Mr. Beard said the club was honoured by the presence of the Dominion president, Mr. E. W. Barnett, and his wife. He congratulated Mr. Barnett on his election as the first active member to hold the position, and mentioned that this was the first Young Farmers' Club social attended by the president since his election.

On rising to speak, Mr. Barnett was greeted with enthusiastic applause, and was accorded musical honours. He congratulated the club on its successful and enjoyable dance. The members had always pulled their weight in all district activities, he said, whether sporting or otherwise. He mentioned especially the North Island tour. If they and other clubs continued to put the same energy into the movement, then his job as Dominion President for the next 12 months would be greatly lightened.

For the benefit of other club secretaries who may be organising similar functions, a summary of the financial side may be of interest. All club members contributed 1/- to cover the purchase of tea, sugar, bread, etc. Milk was provided by members with dairy herds. The takings were approximately £19, of which the orchestra took £9, hire of hall £1, and sundries, novelties, streamers, etc. £1, leaving a balance of £8 to augment club funds.

Members Married.

At the June meeting of the club a presentation was made to two of the foremost members in view of their approaching marriages—firstly, Mr. George Ritchie, who was secretary during the first two years of the club's life, and who was responsible for much of the ground work in establishing the club, and secondly, Mr. Harold Beard, who took over the secretaryship from Mr. Ritchie, and who is chairman for this, the fourth year of the club.

Mr. A. Lawson, advisory president, made the presentations, and spoke of the good work cheerfully put into the club by these two active members. Both replied briefly, assuring members that they would continue to give the club their fullest support.

At Mr. George Ritchie's wedding, which took place the following day, Mr. Harold Beard acted as best man. At Mr. Beard's wedding the best man was Mr. Fred Stuckey, who was chairman of the club during the year the bridegroom was secretary.

Both members will make their future homes in the Kimbolton district.

Correspondence Courses

The attention of young farmers, whether attached to definite Clubs or not, is drawn to the scheme recently started by the Correspondence School of the Education Department. Courses may be taken in farm accounts, building construction, trade drawing, sheep farming, dairy husbandry, dairy science, fertilisers, pastures, soil science, agricultural botany, farm crops, pests, and diseases, as well as in the general educational subjects of a modern secondary school. A nominal fee of 5/- per term is charged.

No preliminary examination requirement is set. Students at present enrolled vary widely in scholastic qualifications from Standard 4 passes to "Oxford Locals" and University degrees.

Particulars may be obtained from The Headmaster, Correspondence School, Education Dept., Wellington, C.1.

Y.F.C. Football Match at Manawatu Show

A RUGBY football match between a team representing the Wairoa Young Farmers' Club and a team picked from the clubs in the Manawatu district was played at the Manawatu Winter Show, Palmerston North, on Thursday, 15th June.

The match, which created considerable interest and provided a great exhibition of Rugby, proved that country football can be both exciting and spectacular.

Manawatu were the winners by 13 points to 5. The scorers for Manawatu were Jarvis and Law a try each, with Thompson converting both, and McKenzie a goal. For Wairoa, H. Brady scored and converted a try.

It is interesting to note that while neither team was at full strength, both contained a large proportion of senior representative players. The Wairoa forwards averaged 14 stone 1 lb., and the Manawatu forwards 14 stone 3 lb.

In a closely contested "curtain raiser," Manawatu Northern Clubs defeated Manawatu Southern Clubs by 8 points to 3.

The top photograph shows the Manawatu team, and the lower photograph the Wairoa team.

The teams were as follow:—

Manawatu.—Standing (left to right): F. E. Sherwood (selector), A. Glassford, E. Bielski, L. H. Thompson, C. Elliott, J. Elliott, E. W. Barnett (district chairman), F. Sowerby, P. Shannon, A. H. Sowerby, G. S. Bolton, R. H. Thevenard, A. J. Galpin (selector). Front row (left to right): G. Mitchell, R. M. Law, L. Revell, K. Spillman, D. Buick (captain), J. McKenzie, G. Arnott, W. Jarvis, R. Galyer.

Wairoa.—Standing (left to right): A. R. Morrison, S. Davies, E. Lindsay, D. Bell, H. Brady, J. Jardine, E. Erickson, W. G. Brownlie (manager), J. Harvey, R. Brownlie, R. Powdrell (captain), F. Listed. Front row (left to right): W. Watson, E. Brownlie, J. Boag, C. Forsyth, M. Munro, L. Collins, W. Powdrell, A. Murray.

Dovedale Club's Dog Trials

THE Dovedale Young Farmers' Club held its annual dog trials on 7th July on Mr. C. Silcock's property. This event is one of the highlights of the club's outdoor activities, and was favoured this year by the weather. There was an attendance of more than 50.

The following is a list of the prize-winners in the various sections:—

Head.—I. Win's "Glen," 1; W. Kenyon's "Pat," 2.

Huntaway.—R. Silcock's "Jock," 1; Carl Davies' "Scot," 2.

Show Bitch.—P. Burnett's "Alert," 1; I. Win's "Moss," 2.

Show Dog.—W. Kenyon's "Pat," 1; F. Burrell's "Joe," 2.

Mr. F. Hodgkinson acted as judge and Mr. R. Kinzert as timekeeper.

Dominion President's Special Appeal To Young Farmers

IN consideration of the state of emergency which is existing in New Zealand to-day, with the consequent disruption of the work and activities of many organisations, I feel that it is vitally necessary to make a special appeal to the various units and individual members of the Young Farmers' Clubs Movement to "carry on."

It is to be expected that the ranks of the various units will be sadly depleted through many members serving in the Territorials, and that the activities of clubs will be considerably curtailed by the operation of the petrol restrictions. But despite these handicaps all clubs should make every effort to hold some meetings and keep the organisation going.

There are many reasons for this, one of the most important being that, should the necessity arise, the movement should be ready to assist the Government in implementing any measures necessary in this national emergency. Further, there is no other organisation which so completely embraces the young men of our country as does the Y.F.C. movement.

I have already assured the Minister of Agriculture on your behalf of the willingness of every member of our organisation to assist the Government in the carrying out of any emergency measures, and I would appeal to you to assist now by, as far as possible, carrying on with your meeting and other activities.

Up to the present the movement has done much for its members, and we now have a wonderful opportunity of demonstrating our loyalty and rendering some service to the movement.

Therefore I appeal to you both individuals and clubs to "do your part."

—E. W. BARNETT
Dominion President

Among the Clubs: Reports on Activities

Western Southland.

Dipton.—Arrangements for concert. Selection of team to take part in district debating contest:—J. Miller (leader), W. Mudie, M. English, and D. Milligan. Mr. G. P. Martin was appointed coach. Short speeches were given by members as follows:—"Grassing of Tussock Land" (J. Miller); "Dralnage" (J. Nevin); "Topdressing" (D. Milligan); "Care of the Team" (C. Gray).

Drummond.—Lecture by Mr. C. Aberdeen on "Disease of Farm Animals." Impromptu speeches by members.

Lochiel.—Arrangements for debate with Lora Gorze Debating Club. Address by Mr. E. S. Thomas, Invercargill, on "General Knowledge for the Young Farmer." At the previous meeting arrangements were made for a debate and a football match with the Thornbury Club.

Thornbury.—Arrangements for a field day; also for a benefit social to raise funds to assist a player who received a broken leg in the football match with the Lochiel Club. Impromptu speeches to be a feature next meeting, and essays on "Farm Management" to be collected. At previous unreported meetings Mr. A. Stuart, Department of Agriculture, gave a talk on "Agricultural Instruction," T. Black (club member) gave an account of the recent North Island tour, and Mr. G. Carmichael gave a talk on "The Agricultural and Pastoral Association."

Woodlands.—Arrangements for Miniature Rifle contest among members. Papers prepared by members to be presented at next meeting. Address by Capt. Green, of Wellington, and Major Lee, of Invercargill, on "Home Defence."

Wyndham.—Decided to assist the W.D.F.U. social and dance. Discussions on proposed Miniature Rifle Competition and also the Territorial system. Address by Mr. J. Lilico on "Sheep-dogs."

Eastern Southland.

Balfour.—Lecture by Mr. W. Peirson, Veterinarian, on "The Lambing of Ewes, and Parasites in Sheep." Impromptu speeches were a feature of the previous meeting.

Crookston.—Selection of two club members to act as attending members at Kelso A. and P. Show. Address by Mr. W. Hubbard, Inspector of Stock, on "Hydatids," followed by general discussion.

Five Rivers.—Address by Mr. T. Elde, Inspector of Stock, on "Hydatids." The club combined with the Farmers' Union for the meeting. At a later meeting sound films on agricultural subjects were exhibited by Mr. S. H. Saxby, Department of Agriculture.

Maitland.—Business meeting; arrangements finalised for debate with the Otama Club in the E. Southland Debating Contest; discussion re stock-judging competitions at the Gore A. and P. Show.

Otama.—Report on debating contest with the Maitland Club, won by Otama. Address by Mr. D. M. Malloch, Accountant, Invercargill, on "The Business Side of Farming." Members of the Farmers' Union were present.

South Otago.

Clinton.—Arrangements for field day. Discussion on Territorial recruiting. Report on Club Concert, which proved a great success. Lantern lecture by Mr. McFedries, of Gore, on "Gyrotillage."

Lawrence.—Debate to be arranged with the Milton Club. Lecturer to be obtained in connection with the Territorial Force. Lecture by Mr. N. McDonald on "Pigs."

Central Otago.

Manuherikia.—Annual meeting. Officers elected:—Advisory president, Mr. R. Brown; club chairman, S. Beattie; secretary and treasurer, A. Brown, jun.

Roxburgh.—Sound films on agricultural subjects exhibited by Mr. S. H. Saxby, Department of Agriculture.

Upper Clutha.—Address by Mr. W. Rowley on "Lincoln College"; the speaker dealt with the history of the college and also the general activities and work carried out there.

Dunedin.

Palmerston.—Address by Mr. S. R. Craig, Inspector of Stock, on "The Stock Act"; the speaker dealt with, among other things, the regulations in connection with diseased stock and the driving of stock, and also explained how to treat dogs with arcoline.

West Taieri.—Arrangements for club ball. Address by Mr. H. Walker on "A Tour of the British Isles."

North Otago.

Duntroon.—Sound films on agricultural subjects exhibited by Messrs. S. H. Saxby and T. Sellwood, Department of Agriculture.

Enfield.—Sound films on agricultural subjects exhibited by Messrs. S. H. Saxby and T. Sellwood, Department of Agriculture.

Five Forks.—The club chairman, C. Ewing, gave an interesting description of the recent Y.F.C. tour of the North Island. At the previous meeting Mr. B. Blackmore exhibited and described lantern slides illustrating livestock in America and Great Britain.

Hampden.—Sound films on agricultural subjects were exhibited by Messrs. S. H. Saxby and T. Sellwood, Department of Agriculture. At the previous meeting lantern slides illustrating livestock in America and Great Britain were shown and described by Mr. B. Blackmore.

Papakaio.—Sound films on agricultural subjects exhibited by Messrs. S. H. Saxby and T. Sellwood, Department of Agriculture.

Tokarahi.—Sound films on agricultural subjects exhibited by Messrs. S. H. Saxby and T. A. Sellwood, Department of Agriculture. At the previous meeting Mr. B. Blackmore showed and described lantern slides illustrating livestock in America and Great Britain; and at an earlier meeting a debate was held, the subject being "Which is the most suitable type of Farming for the District, Agricultural or Pastoral?" The supporters of the Agricultural farming were declared the winners. A discussion on "Recruiting" was held, and the majority of the members decided to join up with the local Territorial unit.

Waitaki-Hilderthorpe.—Sound films on agricultural subjects exhibited by Messrs. S. H. Saxby and T. A. Sellwood, Department of Agriculture. At the previous meeting lantern slides illustrating livestock in America and Great Britain were shown and described by Mr. B. Blackmore.

South Canterbury.

Arno.—Address by Mr. B. L. Elphick on "The Winter Feeding of Breeding Ewes."

Cannington-Cave.—Debating team selected. Report on meeting with Southburn and Maungati Clubs to arrange debating contest for Howell Cup, etc. Lecture by Mr. J. P. Wraight on "Lime and Fertilisers."

Fairlie.—Team selected for district debating contest. Lantern lecture by Mr. J. P. Wraight on "Fertilisers and Soil-testing for Lime-Deficiency."

Geraldine.—Club debate: "Should New Zealand Concentrate on Primary Production?" Speakers, N. Stonyer, A. Morris, M. Brenton, and C. Burrows (affirmative); D. Chisnall, J. Thatcher, C. Kelamn, K. Hibbs (negative). The negative team was awarded the decision. The judge, Mr. J. J. McGuigan, gave some excellent advice on debating.

Hunter.—Arrangements for club ball. Address by Mr. D. Blair, M.R.C.V.S., Department of Agriculture, on "The Meat Grading Regulations and Disease Affecting Stock for Export."

Maungati.—Report on debate meeting. Address by Mr. B. E. Evans on "Timaru Harbour." At the previous meeting prepared speeches were delivered by members.

Milford.—Report on the inter-club debate. Discussion re district dance. Mr. A. Johnson (advisory president) gave a demonstration on "Rope Splicing and Knotting"; he also showed how to make fishing and similar nets by hand. At the previous meeting two debates were held. (1) "That Farming Today is more Difficult than it was Fifty Years Ago"; speakers, A. Caithress, G. Bolderston, G. Crossman (affirmative), and J. Dale, T. Crossman, J. Woodhead (negative); won by the negative side by a narrow margin. (2) "That New Zealand should Concentrate on Primary Production"; speakers, N. Palmer, R. Dale, L. Livesay (affirmative), and G. Lyall, W. McCormick, L. Trumper (negative); won by the negative side. Mr. G. Mulligan acted as judge and after the debate he and Mr. A. Johnson selected the following team to compete in the Inter-club Contest: G. Lyall, N. Palmer, and A. Caithress.

Pleasant Point.—Report on hare drive and also on inter-club debate won by Pleasant Point. Lantern lecture by Mr. C. C. Leitch, Department of Agriculture, on "Potatoes." At the previous meeting a debate was held with the Women's Division, the subject being "That Women should not Encroach upon the Spheres of Activity usually held by Men." Speakers: Mrs. Roberts, Miss D. Talbot, and Miss Olive (negative); N. Wilson, A. D. Talbot, and O. C. Chapman (affirmative); won by the Club (affirmative) team. A club debate was also held: "That Farming Today is more Difficult than it was Fifty Years Ago." At an earlier meeting Mr. Dunn, of the St. John's Ambulance, gave an address on "First Aid."

Waihaorunga.—Debate to be held with Arno Club. A lecture entitled "Practical Experience in Topdressing" was given by Mr. G. Cleland, an advisory member. At the previous meeting a talk on "The Management of the Ewe Flock" was given by Mr. Grant, the talk being illustrated by lantern slides. A successful field day was held at Pentland Hills Station, demonstrations including horses and cattle (Mr. F. Brown) and Corriedale sheep (Messrs. A. Grant and C. H. S. Johnson); there was an attendance of 47 members, 15 of them being visitors from the Arno and Hunter clubs.

Mid-Canterbury.

Ashburton.—Mr. M. J. Scott, Supervisor of the Pig Industry, Department of Agriculture, lectured on "Pigs," illustrating his subject with films.

Hinds.—Lecture on "Veterinary Science and the Farmer of the Future" by Mr. T. K. Ewer. Impromptu speeches by members.

Methven.—Discussion on Territorial recruiting campaign. Inter-club debate between Hinds and Methven clubs: "That the Major Problems of this Country could be solved by Immigration." Speakers: Messrs. Rhodes, Simmons, and Watson (Hinds Y.F.C.); Bush, Wightman, and Poff (Methven Y.F.C.). The debate was won by Hinds. Mr. A. S. Kennedy acted as judge.

Christchurch.

Darfield.—Presentation to Mr. C. O. Redfern, advisory president, on the occasion of his recent marriage, in recognition of his valuable assistance rendered to the club. Arrangements for ball. Debate to be held with West Melton Club. At previous unreported meetings Mr. A. J. Holsten gave a lecture on "Match Ploughing," and Lieut.-Colonel G. F. Hulton gave a lecture on "Home Defence."

Ellesmere.—£1 1s. donated to A. and P. Association as a special prize. Arrangements for a field day at irrigation works, Mayfield. Radio talk to be prepared. Decided that at each meeting two members should give five-minute talks. Address by Mr. E. P. Wills on "Various Aspects of Farm Law."

Springston.—Report on district committee meeting. Arrangements for debate. Sound film on land clearing exhibited by Messrs Gough, Gough, and Hamer.

Teddington.—Arrangements for field day. Impromptu speeches by all members present; the speeches were summed up and commented on by Mr. J. W. Calder, of Lincoln College.

North Canterbury.

Amberley.—Report on annual meeting of Federation at Wellington by D. F. Coleman, a delegate to the conference; Mr. Coleman is chairman of the Canterbury Council and vice-president of the Federation. Arrangements made for members to attend field day and stock-judging at Lincoln. Discussion of Centennial tree-planting scheme.

Amuri.—Representatives to compete in stock-judging at Lincoln. Arrangements for a debate, the subject to be "That Territorial Training should be Compulsory." Report and balance-sheet of annual dance. Arrangements for field day. Address by Mr. E. D. R. Smith on "The Legal and Financial Side of Farming."

Cheviot.—Arrangements for dance. Football match with Scargill-Omihi Club to be held. Short talks given by members. At the previous meeting a lecture was given by Mr. McLean, of Lincoln College, on "Diseases of the Breeding Ewe."

Hawarden.—Address by Dr. Hullett on "Wheat Research"; members of the Farmers'

Transport Truth

Common Sense Should Be the Basis of the Commonweal in British Countries

Common sense in transport is surely railway transport, especially in New Zealand where the people own the railways, and have them controlled by their own representatives for national welfare from all view-points.

Railways will always be necessary to maintain and increase the strength of the British Commonwealth of Nations for purposes of peace and defence.

Loyalty of New Zealanders to their railways is loyalty to themselves. Here is a case where self-interest is the national interest.

Your Railways for Peace and Defence

Union were present by invitation. At the previous meeting Mr. J. Inkson, advisory president, gave a talk on "Grasses."

Oxford.—Report and balance sheet of annual ball. General talk on "The Benefits of Herd Testing," by Messrs. Goldsman, Rowlands, and Humm.

Scargill-Omihi.—Challenge from Cheviot Club to football match accepted. Inter-club debate to be supported. All members present gave three-minute talks on subjects of their own selection. At the previous meeting Mr. J. W. Hawker gave an address on "The Care and Training of Sheep-dogs."

Westland.

Murchison.—Election of five new members, bringing total to 41. Consideration given to proposals of Refugee Emergency Committee. The matter of defence was discussed, and it was decided to support the R.S.A. endeavour and to offer co-operation in establishing a local territorial unit. Address by R. S. Hayes, a club member, entitled "Memoirs of Lincoln College."

Nelson.

Motupiko.—Business meeting. Arrangements for field day at Kaka lime works. Debate to be held at next meeting.

Moutere.—Report on inter-club debate held with Dovedale. Address on defence matters by two officers of the Defence Department, Nelson.

Marlborough.

Flaxbourne.—Lecture by Mr. G. Wastney on "Television" and other relevant topics. Mr. Wastney explained to a very interested audience the workings of a television transmitter and receiver. At meetings previously unreported Mr. G. D. Shand, Inspector of Stock, addressed members on "Lymphadenitis, and Other Diseases of Stock," and a mock court was held, members being asked questions bearing on lectures, etc., procedure being carried out as in a court room. Mr. E. Rutt was declared the winner.

Wairarapa.

Alfredton.—Semi-final of district debating contest, between Tinui and Alfredton clubs, subject being "Whether Further Subdivision would be to the Advantage of New Zealand." Tinui team (negative): E. N. Schofield, R. P. Curran, and R. E. Spooner; Alfredton team (affirmative): R. Weston, I. McDonald, and B. Galbraith. The debate was won by the Tinui team; Mr. Taylor acted as judge.

Ballance.—Arrangements for spring ball. Address by Mr. E. E. Elphick, Government Veterinarian, on "Seasonal Stock Diseases."

Carterton.—Team entered in seven-a-side Rugby tourney at Palmerston North. Report on table tennis match with Masterton, Carterton winning by 15 games to 11. Address by Captain R. P. Wakelin (1st Hawke's Bay Regiment) on "The Defence of New Zealand."

Featherston.—Business meeting. Report and balance sheet of dance; £2 10s voted to entertainment committee funds.

Greytown.—A report on the Wairarapa Y.F.C. South Island tour was given by V. H. Gates.

Mangatainoka.—Talk by Mr. L. T. Herbert on his trip to Japan and China, via Australia and Thursday Island, returning via Singapore and Java. At the previous meeting Mr. E. E. Elphick, Government Veterinarian, gave an address on "Spring Trouble in Cows."

Martinborough.—Talks by members on various subjects; Mr. A. B. Martin acted as adjudicator, allotting points for the Campbell Seivers Memorial Cup.

Masterton.—Address on "Fat Lamb Breeding" by Mr. N. Blatchford, Wairarapa Training Farm, and a short talk by W. Cooper on "Burnt Lime v. Carbonate of Lime."

Pongaroa.—Field day at Mrs. Martin's woolshed, Akaroa Road; Mr. J. Duncan, Department of Agriculture, gave a lecture on the modern wool-shed, and demonstrated on a model of extensive size that he had brought with him.

Manawatu.

Apiti.—Address by Mr. T. L. Seddon entitled "The Farmer and the Law"; the speaker gave a comprehensive outline of the law as it affects the farmer.

Colyton.—Final arrangements for annual concert and dance. Mr. R. Swainson, of Feilding, exhibited a film taken while on a world tour, the chief countries visited being Australia, Egypt, Great Britain, the Continent, and U.S.A.; the screening occupied over two hours.

Feilding.—Decided to issue a bulletin between meetings to keep in constant touch with members. Field day at Massey College arranged. Talk by Mr. H. A. Stewart, an advisory member, on "The Care of the Breeding Ewe before and after Lambing."

Fitzherbert.—Arrangements for dance. Film exhibited by Dr. McMeekan illustrating a tour of Denmark, Sweden, and Argentine; also a short film on "Artificial Insemination."

Halcombe.—Address by Mr. M. A. Elliott, of Palmerston North, on his trip to Australia.

Kimbolton-Kiwitea.—Report on dance. Mr. Bruce McLeod spoke on "Farm Plantations and Shelter Belts"; the talk was illustrated by lantern slides shown by Messrs. Drake and Earl, Department of Agriculture.

Levin.—Films exhibited by Sergeant-Major Holmes, of the Defence Department, on "Home Defence." Seven members of the Levin Territorial Unit were present by invitation. A field day was held, taking the form of demonstrations on sheep and dairy cattle, followed by judging competitions. Winners:—Sheep: R. Speedy 1, A. Horn and P. G. Carter, equal, 2. Dairy cattle: A. Horn, 1; R. Horn and W. Lewis, equal, 2; R. Speedy, G. Elliott, and B. Bartholomew, equal, 3.

Opiki.—Arrangement of programme of lectures, etc. Appointment of stewards. Team to be entered in a seven-a-side football tourney. Address on Y.F.C. work generally by Mr. L. Earl, Department of Agriculture.

Oroua Downs.—Dance to be arranged. Team to be entered in seven-a-side football tourney. Arrangements for future meetings.

Otaki-Te Horo.—Address on "Proportional Representation" by Mr. E. J. Graham.

Pohangina Valley.—Report on Wellington Council meeting by H. M. Linklater. Talk on Y.F.C. tour of West Coast (S.I.) by V. Sinclair. Lecture by Mr. P. Macdonald, advisory president, on "Farming and Markets."

Rangiotu.—Dance to be held. "Travel Talks" given by members. At the previous meeting an address was given by Mr. J. Linklater on "Parliamentary Procedure."

Rongotea.—Radio talks to be prepared. Arrangements for football practice. Club debate: "That an Agricultural College Education is of more value than Practical Farming Experience."

Shannon.—Discussion regarding annual meeting of the Federation, and the motion carried regarding defence.

Tokomaru.—Business meeting. Arrangements for dance, etc.

Woodville.—Sound films of agricultural and general interest exhibited by Mr. J. Holden, Department of Agriculture. At the previous meeting an address was given by Mr. Bruce McLeod, of Colyton, on "Shelter Belts and Tree Planting," lantern slides illustrating the subject being shown by Mr. Drake, Department of Agriculture.

Wanganui.

Bulls.—Committee set up to arrange details of Centennial tree-planting scheme. Demonstration on "First Aid" by members of St. John Ambulance. At the previous meeting an address on "Afforestation" was given by Mr. R. O. Dalrymple. A field day was held on Mr. C. E. Viles's property, demonstrations including "Southdowns" (Mr. C. E. Viles), "Romneys" (Mr. W. K. Morton), and "Horses" (Mr. H. E. Hocken); in addition judging competitions on both types of sheep were carried out.

Hunterville.—Decided to assist in the Centennial tree-planting scheme. The club secretary, Alec. J. Cameron, gave an interesting talk on "Impressions of Australia."

Marton.—Discussions on the following:—Proposed tour by the Wanganui District clubs in 1940; district essay competition; annual general meeting of Federation at Wellington; and Territorial recruiting. An address on "Farm Accountancy" was given by Mr. D. B. Sladden. At the previous meeting short talks were given by members as follows: "Modern Farm Machinery; Its Advantages" (M. H. Morrison); "Potato Growing" (F. L. Smith); "Parasitic Gastritis in Sheep" (W. Emmett).

Taihape.—Address on the "Recruiting Campaign and Home Defence" was given by Major Laws and Sergeant-Major Holmes.

Westmere.—Discussions on the district essay competition, and Y.F.C. stock-judging at the Wanganui A. and P. Show. Team selected to take part in a seven-a-side football tourney at Palmerston North. An address on "Home Defence" was given by Captain C. R. Leach; the speaker described the organisation of the N.Z. Military Forces and detailed the different branches of the Service.

South Taranaki.

Alton.—Team selected for football tournament at Eltham. Invitation accepted to play Patea third grade Rugby team. Short talks by members who visited factories, etc., in Wanganui, and talks by J. Drury and T. Boyce on the recent Wanganui educational week. Gymnastic demonstration by Lieutenant Mackay.

Hawera.—Members who took part in the recent Y.F.C. tour of New South Wales related their experiences and described their trip.

Kaponga.—Team to take part in Rugby football tournament at Waitara. Report and balance sheet of annual dance. Special appeal made for recruiting in local Territorial unit. Talk by G. Gordge on his recent trip to Australia with the Y.F.C. touring party.

Pukengahu.—Arrangements finalised for shooting match with Farmers' Union. Talk on "Farming in Southland" by Mr. McNab. At a later meeting G. Harris and J. Murphy spoke of their experiences while on tour in Australia with the Taranaki Y.F.C. party.

Whakamara.—Discussion on "Home Defence"; decided to ask one of the staff of the local Defence Office to lecture at the next meeting. The club chairman, S. Wrigley, gave an interesting account of his tour in Australia with the Taranaki Y.F.C. party.

North Taranaki.

Cardiff.—Election of member to represent the club on the committee of the Stratford A. and P. Society. Talk on "Herd Management" by Mr. Leslie, Veterinarian.

Hillsborough-Tarurutangi. — Club debate "Town v. Country Life." Speakers: P. Meharry, N. Sampson, D. Martin, B. Sinclair, E. Anderson (country); P. Locke, R. Greenaway, R. Dixon, S. Style, C. Colson, N. Warren (town). The decision was given in favour of the supporters of country life. At the previous meeting an address was given by Mr. Warren, entitled "Fifty Years of Farming in New Zealand."

Inglewood.—Club debate, "That the Pioneers worked harder than the Farmers of Today." Speakers: L. Sutton, H. Clough, P. Marr (affirmative); N. Bracegirdle, J. Stackhurski, R. Collingwood (negative). The judge, Mr. McIntyre, gave the decision to the negative side.

Karawaka.—Business meeting. Debate arranged with Std. 6 pupils of Lepperton School, the subject to be "That in New Zealand greater emphasis should be placed on the Development of Primary rather than Secondary Industries."

Mangamahoe.—Business meeting. Discussions on annual general meeting of the Federation at Wellington.

Mangorei.—Business meeting, followed by a table tennis tournament; after some exciting matches D. Gleye won the club championship.

Midhurst.—Arrangements for dance. Election of extra members to club committee. Mr. J. E. Davies to be asked to address the next meeting.

Okau-Tongaporutu.—Lecture by Mr. E. J. W. Foreman on "The Control of Weeds." A field day was held, the main feature of which was the judging of hay and ensilage by Mr. G. A. Blake, Department of Agriculture; a judging competition among the members was won by O. Collins.

Omata.—Dance to be held. Team to compete in Y.F.C. Rugby tournament at Waitara. Address by Mr. Lynch on "Factory Work Generally."

Rahotu.—Arrangements for euchre party. Club debate, "That Motor Trucks are superior to Horses for Farm Transport." The debate was judged by Mr. G. P. Dawson, and won by the affirmative.

Tikorangi.—Arrangements for field day and also for a flag 500 card party. A debate was held with the Tikorangi Boys' and Girls' Agricultural Club, the subject being, "Should School Children Work on Farms?" Mr. C. P. Mahy acted as judge. The Boys' and Girls' Agricultural Club team, which took the negative side, won the debate by 65 points to 57.

Toko.—Discussions re field day; final arrangements for dance. Address by Mr. A. F. Schere on "World Affairs."

Urenui.—Field day; a party of twenty members visited Thos. Borthwick and Co.'s freezing works at Waitara, being shown the various operations, including the killing for chilled beef, etc. The Smart Road Fertiliser Works were then visited, members being shown the different processes and stages in the manufacture of fertilisers.

Southern Hawke's Bay.

Hastings.—Club debate, "That Disease Control in Stock is of greater Economic Importance than the Breeding of High Producing Strains." Speakers: F. Hildreth, T. Tomoana, K. C. Campbell (affirmative); H. M. Campbell, R. Joll, E. Marshall (negative); the debate was won by the affirmative. Lecture by Mr. A. D. M. Laing, Government Veterinarian, on "Lambing Trouble and Worm Infestation in Hoggets."

Norsewood.—Address by Mr. E. N. Hogben, on "Some Impressions of Australia."

Onga Onga.—General discussion by members on the differences between farming in the North and South Islands.

Waipukurau.—Lecture by Mr. J. W. Palmer, Department of Agriculture, on "General Cropping and Grazing in Hawke's Bay."

Northern Hawke's Bay.

Putorino.—Five-minute talk by E. Boustead, club member. Addresses were given by the following:—Mr. I. L. Elliott, Department of Agriculture ("Farm Management Survey Work"), Mr. K. Bayliss, Public Accountant, Hastings ("Farm Accountancy"), and Mr. R. P. Hill, Department of Agriculture ("Early Spring Pasture Management").

Wairoa.—Discussions on the following: Holding of a rodeo to raise funds for the Centennial Memorial; debating; Wellington Council funds, £5 being granted towards the establishment of a reserve; report of annual general meeting of Federation in Wellington. Lecture by Mr. A. D. M. Laing, Government Veterinarian, on "Worm Infestation in Sheep."

Taumarunui.

Ohura.—Lantern lecture on "Hill Country Pasture" by Mr. J. M. Hopkins, Department of Agriculture.

Taumarunui.—Field day held in Mr. H. Allan's orchard, Taringamotu Valley, comprising demonstrations on general orchard work and pruning by Mr. J. W. Whelan, Department of Agriculture. There was an attendance of 48.

Te Kuiti.

Otorohanga.—Business meeting; suggestions for field days, lectures, etc.

Eastern Bay of Plenty.

Edgecombe.—Business meeting, debate to be arranged with local W.E.A.

Opotiki.—Discussions on recruiting, etc. Arrangements for delegates to attend council and district committee meetings. Addresses as follows:—"Banking" (Mr. Reeves), "Valuation Scheme for Club Members" (Mr. Brown).

Waimana.—Address by Mr. N. V. Hodgson on "Legal Matters as they Concern the Farm"

Western Bay of Plenty.

Paengaroa.—Arrangements finalised for third birthday party. Field day to be held. Following members reported on the Y.F.C. tour of North Auckland: P. Voltz, A. Riddell, E. Blackmore, T. Singleton, J. Singleton, W. Marshall, A. Walter, and C. Riddell.

Tauranga.—Challenge to debate accepted by Farmers' Union. Lecture on "The Home Orchard" by Mr. A. M. W. Grieg, Department of Agriculture. Mr. Whyte gave a talk on "Recruiting," outlining conditions in the Territorials. At the previous meeting a talk was given by Mr. F. W. Ream on "Malpresentation and Diseases of Stock." A successful dance was held in the Town Hall, Tauranga, to entertain a visiting party of young farmers from North Auckland; there was an attendance of over 500.

Te Puke.—Discussion on home defence and recruiting, the meeting resolving to give full support to the Federation recommendation. A description of the Y.F.C. tour of North Auckland was given by B. Caldwell, a member who participated. A field day was held at Mr. Nichols' farm, taking the form of a pruning demonstration given by Mr. A. M. W. Grieg, Department of Agriculture.

Rotorua.

Rotorua-Ngongotaha.—Field day and stock-judging to be held. A general discussion took place on "Fertilisers," members taking part as follows:—Mr. F. Turner, advisory president (ammoniated super), J. Bray (potash), E. Hunt (sulphate of ammonia), J. Martin (guano), Mr. C. S. Dalgleish, Department of Agriculture, spoke on "General Manurial Treatment."

Waitkato.

Cambridge.—Address by Mr. G. A. Walsh on "Lime Breeding." At previous meetings talks were given by Mr. W. N. Perry on "The Old System of Marketing and the Guaranteed Price Method," and Mr. F. H. Anderson on "How to Conduct a Meeting." A field day was held on Mr. Bremer's property, Rukuhia; Mr. Bremer demonstrated on Romney and Southdown sheep and Ayrshire cattle. There was an attendance of 34, four of whom were visitors from Matangi Y.F.C. The club also combined with the Farmers' Union and W.D.F.U. in a successful dance.

Huntly West.—Discussions as follows: Annual general meeting of Federation; Centennial tree-planting scheme; the advisability of allowing young men not directly connected with farming to become active club members. New wrestling mat procured.

Tahuna.—Activities discussed and arranged; badminton guest night; dance; visit to Horotui freezing works; club debate. A committee was appointed to arrange for football match with Tauhei Y.F.C.

Tauhei.—Business meeting. Discussion regarding ways and means of augmenting club funds. Challenge issued to Tahuna Y.F.C. to a football match.

Te Awamutu.—Programme of lectures, etc., arranged. Field day to be held. Arrangements for dance left to committee. Talk on "Home Defence" by Colonel C. J. Pierce. Field day on Mr. A. S. Wyllies' farm. Mr. K. M. Montgomery, Department of Agrgiculture, conducted members over the farm, and dealt with farm and pasture management generally. There was an attendance of 41. This club has been in existence for barely three months and now has a membership of 65.

Te Kowhai.—Arrangements for films to be exhibited by the Pig Marketing Association. Club debate, "That the Tractor is more suitable than the Horse for New Zealand Conditions." Mr. Witherford acted as judge, the negative team gaining the decision by 244 points to 216.

Auckland.

Clevedon.—Delegate appointed to the Auckland Council. Social committee to arrange functions, etc., to raise funds. Seven new members elected. Address by Mr. W. S. Cook, Clevedon schoolmaster, on "The Cause of World Slumps."

Franklin.—Debate to be held with Mangatawhiri Y.F.C. C. Wood and R. Franke appointed delegates to district committee. Discussion on "Home Defence and Military Training." Two successful dances were held recently, netting the club a profit of £10 10s and £9 15s respectively.

Harrisville.—Delegate district committee elected. Lecture on "Animal Troubles" by Mr. L. R. McIndoe, of Ngatea. A field day was held on Mr. R. D. Kerr's property, Onewhero; a feature was the demonstration on a dairy type cow by Mr. R. A. Lewis, of Pukekohe, followed by a judging competition for members on another cow. Mr. Kerr's pig lay-out was also inspected.

Mangatawhiri.—Arrangements for field day. Lecture by Mr. H. W. Carberry, Government Veterinarian, on "Diseases in Stock." The speaker dealt with contagious abortion, milk fever, and mamitis.

Mauku.—Delegate to district committee appointed. Discussion on programme of meetings and field days. Address by Mr. Woolsey on "Meeting Procedure." At the previous meeting a lecture on "The General Treatment of Livestock" was given by Mr. McIndoe. At a field day held at Patumahoe, Mr. McIndoe conducted a post-mortem on a diseased cow; there was an attendance of 30 at the field day.

Warkworth.

Port Albert.—Arrangements finalised for club concert. Club debate, "Hay v. Ensilage."

Whangarei.

Keri Keri.—Election of advisory president and two advisory members; delegates appointed to attend Y.F.C. meetings outside Keri Keri. Lecture on "Chairmanship" by Mr. J. Lyness. At a recent field day, members were addressed by Mr. Courtenay Hall on "Anthroposophy," with special reference to the biodynamic method of fertilisation.

Matarau.—Debate to be held with Junior Chamber of Commerce. Club to visit Keri Keri fruit area. Arrangements for a dance to raise funds to assist Chinese refugee children. Sound films on agricultural subjects exhibited by Mr. E. B. Glanville, Department of Agriculture. At the previous meeting a discussion took place on "National Defence" and a lecture was given by Mr. T. H. Hankin, Government Veterinarian, on "Pregnancy and Parturition in Dairy Cows."

Dargaville.

Marohemo.—Members who took part in the Y.F.C. tour of the Bay of Plenty gave brief outlines of their experiences on the trip.

Tangiteroria.—Discussion on proposal by members to form an infantry platoon in the 15th North Auckland Regiment; the proposal was carried by the meeting. Arrangements for field day. Address by Captain R. W. Harding on "The N.Z. Territorial Force and its Units."

Kaitaia.

Umawera.—Annual birthday of club to be celebrated. General discussion on the "Best Method of Draining Clay Land."

Health Notes for the Farm

Contributed by the Department of Health

You Can Have Only One Pair of Eyes

THEREFORE—

Guard Them Well

THE mind would remain a blank except for the sensory experience, which is built from the impulses which come through the five special senses—sight, hearing, smell, taste, and touch.

Of the five senses the average person places the highest value on sight, and loss of sight strikes him as the worst physical misfortune which can befall him. It is a great loss to be denied the sight of "shades of beauty, the sun, the moon, trees old and young." Scientists, artists, and craftsmen have become eminent by the use of the eye, and by the training of the faculty of observation.

The education of the individual is largely accomplished through visual imagery, that is, through the ever-changing pictures of the world about us upon the retina, that sensitive screen at the back of the eyeball. Indeed, the effectiveness of spoken language rests largely upon its appeal to the visual memory. One need only observe the handicap of blindness upon the activities and education of the blind to appreciate the importance of sight.

Like a Camera

Space does not permit of a detailed description of the anatomy of the eye or of the complicated process of vision and the fundamental principles involved other than to contrast the eye to a photographic camera. The way in which the image of, say, an object, is focussed through the lens situated in the blue or brown part of the eye is somewhat similar to the way in which the image is focussed by the lens of a camera. Instead of the film which is placed in the camera, Nature has supplied a film called the retina at the back of the eyeball which receives impressions of objects. We do not need to go into a dark room to develop these impressions into pictures, because they are now really a part of us.

Although the eye and the camera closely correspond in general structure, yet there is, of course, a material distinction between them. The eye sees, but the camera merely receives and records one definite impression. The eye not only receives a series of impressions of all that goes on in the field of vision, but it telegraphs them to the brain in the form of a continuous stream of visual information by means of the optic nerve which is connected with the brain. The eye is not a lifeless optical organ, but a delicate organ in intimate contact with the brain and nervous system.

We will now consider some common defects and troubles of the eye, particularly in children.

In Infants

Among diseases to which newly-born infants are exposed and which may lead to blindness is the dreaded ophthalmic neonatorum. It is estimated that 20 per cent. of all cases of blindness are due to the results of this disease. However, thanks to preventive measures now in use by all physicians and midwives, cases of blindness from this cause are being greatly reduced. Any discharge, redness of the eyes or lids of a babe should be immediately reported to the physician in charge.

The eyes of babies and young children should not be exposed to glare. In fact, close, brilliant, and direct light should be avoided by everyone. When infants are put to sleep out of doors some protection should be afforded by a shade of non-reflecting material or hood to the perambulator. Brilliant linings to perambulators should be avoided. One of the best colours for inside a pram-shade is green.

Common Defects

Near Sight (Myopia)

As stated, the eyes are like a camera. When you gaze at an object your lens projects the image of it on the retina, which is sensitive, like a photographic film or plate. If your eyeball is relatively long the image of the object is formed before it reaches the retina and you see it imperfectly. This is "Near," or, as it sometimes called, "short," sight.

This condition should receive early treatment. A child suffering from it cannot see anything clearly in the distance, and in reading brings the book close to the eyes. If neglected, the sight may become steadily worse—often rapidly worse in a studious child

—and may lead to practical blindness. The progress of the trouble can be checked and the defect corrected by means of suitable glasses and by improvement in general health of the child. It is most urgent that the work given them should be subject to medical approval.

Far Sight (Hypermetropia)

If your eyeball is relatively short the picture of an object looked at strikes the retina before it is clearly focussed, and the object is blurred. This is "far" sight, or "long" sight. This condition is more common among children than "near" sight.

If it results in eye strain this may be shown by frowning, red eyelids, squinting, headache, nervousness, or backwardness. All these symptoms can be relieved by wearing suitable glasses. When glasses are prescribed parents should insist on their children wearing them.

Astigmatism

This means that your eyes do not focus the light rays and bring them to a single point as they should; they let the rays in unevenly. When you look at print little lines seem to form around the margin of the letters.

What causes this? The cornea (the transparent protective membrane in front of the eye that fits over it like a watch glass) is really the cause of the trouble. If you can imagine your watch glass as not being "true" in every part of it, having some parts more curved than others, you have an exact idea of astigmatism. The outer covering, or cornea, of your eye is in the same way unequally curved, so that the rays of light are not gathered in evenly and focussed clearly by your lens.

This condition may be associated with either "near" sight or "far" sight. It sometimes results in headache and nervousness, and can be corrected by suitable glasses.

Cross-eyes, or Squint

It is of the utmost importance that this defect should be treated as early as possible. Sometimes a baby may be noticed to squint within the first year or two of life, or the condition may be noted later, especially following an illness. It is a mistake to wait until the child has had a squint for three or four years in the hope that it may grow out of it. To delay treatment is to lessen tremendously the chance of cure.

The trouble can frequently be rectified by glasses alone if treated early.

Keeping Away Mosquitoes and Sandflies

Some recent work carried out by C. G. McNay, Division of Entomology, Canada, in connection with the use of repellents against biting flies may prove of value to us in New Zealand against some of our native insect biting pests, such as sandflies and mosquitoes, etc. McNay's experiments extend over a period of three years, and during this time a large series of repellent materials was used.

The most successful formula following these experiments proved to be as follows:—

Oil of thyme, ½ fl. oz.
Castor oil, 2 to 3 fl. oz.
Concentrated extract of pyrethrum in mineral oil (to the extent of approximately 1-5th lb. of pyrethrum flowers per fl. oz. of concentrate), 1 fl. oz.

The pyrethrum used by McNay was a mineral oil extract of pyrethrum, 1 fl. oz. of which contained the extract of approximately 1-5th lb. of pyrethrum flowers. It is, of course, essential that the pyrethrum be of good quality and known strength.

The above material, like any other repellent, is smeared on to the exposed parts, and is said to be effective over a period of from three to five hours. It may prove invaluable to some people, particularly campers near bush streams where sandflies are frequently very abundant.

—J. MUGGERIDGE, Government Entomologist, Plant Research Bureau, Nelson.

If not treated, the sight of the crossed eye will become poorer, until at last it becomes practically blind.

Inflamed Eyelids

The cause of inflamed eyelids is simple, and the complaint can be cured by bathing night and morning with warm boracic lotion, carefully removing all crusts from the edges of the eyelids. To soften crusts apply some mild ointment (such as weak boracic, vaseline, or golden eye ointment) nightly after bathing. If the condition does not disappear a doctor should be consulted, as it may be due to some underlying cause, such as defective vision or general debility.

Trachoma

Trachoma is a chronic contagious form of eye disease which causes a specific destructive inflammation. It is not unknown in New Zealand, particularly among the Maori race. It flourishes best where sanitary conditions are worst.

Prevention consists not only in avoiding infection, but by maintaining superior hygienic and sanitary conditions, for trachoma does not flourish in such soil.

Presbyopia

As we grow older we need spectacles for reading and near work. This may not be due to disease, but to decline in the powers of accommodation, that is, of altering the power of the eye to focus near objects. This decline begins invariably between forty-five and fifty years of age.

The first sign is difficulty in reading small print. Its relief is quite simple —wear suitable spectacles when and where necessary for clear vision. As age advances the spectacles require to be increased in strength. Glasses for reading should be obtained as soon as it is realised that they are needed.

In children who habitually take up peculiar positions, who hold the head to one side, who squint, who have red eyelids, who make frequent mistakes in reading and writing, or who frequently complain of headaches, defective eyesight should be suspected and skilled advice should be obtained.

Prevention

In young children the continual use of the eyes for close or fine work should be avoided, and all books should be well printed. The print should be large and well spaced. Prolonged reading should be forbidden in young children. To be able to read at too young an age is a doubtful blessing, and results in much eye and nerve strain. Children should not attend picture shows frequently, and when they do it is important that they should not sit too near the screen or too far to the side; they should sit as near as possible to the middle of the hall.

During convalescence from illness many children read excessively. At this time the eyes share the general weakness of the body and require rest.

Care is especially necessary after the common infective fevers, such as measles, scarlet fever, etc. Complete restoration to health after illness is of the utmost importance.

See that children always work in a good light. They should hold the reading-matter or work at least 12 inches from the eyes. Excessive glare on the book should be avoided. The paper should have a dull, not glossy surface, and the light should fall over the shoulder, the left preferably, for writing. Ground-glass shades or lamps or frosted globes are advisable over bright lights, and if it is possible to have the light partially reflected from the ceiling it is better than a brilliant, close, direct light. When reading in bed one should sit erect and avoid straining the neck and eye muscles. Reading in a dim or flickering light should be avoided.

Occasional Rest

Continuous use of the eyes for reading and close work should be avoided by adults as well as children. An occasional slight rest or change of occupation, even for a few minutes, will often prevent eye strain. Eye strain may be evidenced by pain around the eyes or a headache increased by the use of the eyes, especially for close work, often accompanied by blurred vision, drowsiness, watering of the eyes, and irritated condition of the lids, such symptoms becoming aggravated at night or when artificial light is used, or when a person is fatigued.

The relief afforded by the prescription of proper glasses is often remarkable. During periods of exposure to unusual glare of the sun on the snow, or at the seaside, coloured glasses may be worn occasionally, but not continuously . They should be of good quality and non-refracting. Light amber is the best colour.

Protective devices, such as goggles, should be used by those engaged in work exposing them to flying fragments. A visit to an eye department of a public hospital would immediately convince any intelligent worker of the extreme need of protecting the eyes from flying fragments of metal, wood, stone, etc. The eyes should be protected from intense light and injurious radiations from industrial processes.

Excellent eyesight is needed in motoring, and when it is realised that a motor-car going 25 miles an hour will travel 50 feet in a second one must realise how seriously the margin of safety is impaired when such a car is controlled by a person whose eyesight does not come up to the standard laid down by the licensing authorities.

Conserve Your Vision

Remember that the eyes are the most delicately-constructed organs in the body, and that a good pair adds much to one's joy and usefulness in life. They are intended for use, and should last a lifetime.

If they are uncared for the time may come when the light seems to be ebbing out of the world, as in the case of the sea captain in the short story, "The End of the Tether," by Joseph Conrad, in which we read ". . . the old ship was his last friend; he was not afraid of her; he hardly dared to look for fear of finding he could see less than the day before. A great uncertitude enveloped him. The horizon was gone; the sky mingled darkly with the sea. Who was this figure standing over yonder? What was this thing lying down there?"

The conservation of vision takes place second only to the conservation of life itself.

New Dry Process for Non-Shrink Wool

THE successful development of a reliable unshrinkable process, in addition to those already available to the industry, is a matter for congratulation, says the last number of the I.W.S. News, journal of the International Wool Secretariat, which represents in Britain and on the Continent the interests of New Zealand, Australian, and South African wool growers.

The so-called shrinkage of woollen fabrics is often more a matter of felting of the fibres, due to the interlocking of the edges of the microscopic scales which surround the wool fibre, than of true shrinkage. The "feltability" of wool is, of course, its great virtue for many purposes, but when felting is not desired it is anything but a virtue. The several processes all aim at the sealing, in one way or another, of the projecting edges of the tiny scales.

After years of patient experimentation in relation to tops, yarn, and fabric, the unshrinkable process of the Wool Industries Research Association evolved at Torridon research laboratory is now being taken up by the industry, both in the West Riding and the Midlands. Several mills have already installed the necessary plant, while others are proceeding with plans which will make large-scale production possible. One virtue of the Torridon process is that satisfactory treatment is covered by the published specification and a Certification Trade Mark of the Board of Trade identifies the article for the consumer.

The Wool Industries Research Association wisely draws a distinction between control of felting of the wool fibre and shrinkage due to changes in area or shape of a garment due to release of mechanical stresses acquired during manufacture or finishing, as, for example, those caused by boarding out. The W.I.R.A. process, in common with any other, will only prevent felting, and not shrinkage due to goods being marketed in a stretched condition. This distinction should be appreciated not only by manufacturers but by the public, if misunderstanding is not to arise.

The claim is made from Nottingham that a quite new process enables wool to be rendered completely unshrinkable by a dry process, applicable at any stage of manufacture from raw wool. Cloths so treated, it is claimed, stand up to hard wear and washing and retain the new property given them, while losing nothing of the natural wool advantages of strength and softness. Chlorine is not used in this process, and the final stage removes all chemicals and leaves the wool 100 per cent. pure.

The Farm Home and Kitchen

Contributed by the Association for Country Education

The Art of "Good Buymanship"

HOW good a buyer are you? Do you invariably "get the most" for your food shilling or your clothing shilling? Do you know a good egg-beater from a poor one? Can you tell which saucepan is the best type for your stove?

Are you the kind of person who flits from one shop to another all afternoon, ending up at 5 o'clock with—exactly nothing? Or do you dash into town at 3 o'clock and out again at 4 o'clock with your arms filled with parcels?

Answer these questions frankly, and you will know whether you are a really good buyer or not.

Many Temptations

Today the would-be wise buyer has a difficult path to follow—difficult, not as our grandparents found it difficult (because of scarcity of foods and lack of choice), but difficult because of the immense number and variety of things offered for selection.

Never before have there been so many shops—never before such a bewildering array of things on their shelves—never before has such high-pressure salesmanship been brought to bear—never before has there been such clever advertising.

In other words, never before has a buyer needed to keep her, or his, wits and her sound common sense close behind her or to **think** more definitely than she has today. Yet we find there are many—men and women alike—who allow high-pressure salesmanship, attractive bottles, and extravagant advertising to trick them into making many a foolish purchase.

Today, buying is an art—an art which extends into the domain of food, clothing, and equipment.

Art of Buying Food

In the average home food takes a high percentage of the income, and while in the farm home the buying of it is not quite such a problem as in the town home, nevertheless some things do have to be purchased.

"It takes a great deal of boldness mixed with a vast deal of caution to acquire a great fortune; but it takes ten times as much wit to keep it after you have it as it took to make it."

—Mayer A. Rothschild.

In other words, it takes very much less time and effort to SPEND a shilling than it does to EARN it!—And, we might add—sometimes a great deal more THOUGHT.

Here are a few useful points to remember when you do go food shopping:

1. Make a list of what you need and stick to it.

2. Ask for the price before buying.

3. Ask for weights and measures instead of for "a shilling's worth."

4. Remember that buying in bulk saves money. For example, a 50lb. bag of flour costs 8s. 3d., compared with 10s. 5d when it's bought by the lb.

5. Buy fruits and vegetables "in season."

6. Watch the market for price changes, and be prepared to make changes in your menu.

7. Planning the menu for three or four days ahead permits better "buying plans" to be made.

8. Select perishable goods in person, but order staple goods by the name and brand you've learned by experience to be good. Determine the brands you want before you order, and read all the labels on tinned and packaged foods.

Buying Clothing

But food is not the only tug on the purse strings. Man must be clothed as well as fed, and there is an art to the buying of the garments he wears.

Here we find the problem is not only how to spend but what to buy and how to know what one is buying when one does spend. The answer to the first problem must be given by each individual herself, and the answer to the last can be found only through inquiry, experiment, and study.

Our advice to all who shop for materials is to ask for samples, and, with these, to carry out a few simple tests which will give an idea of whether the materials will stand up to wear, to laundry, to dry cleaning, to pressing, and to crushing.

Useful Guides

In general, guides which will help you "to get the most" for your "clothing shilling" are these:—

1. Take an inventory of the clothes you have, and decide what new ones you really need.

2. Learn to know fabrics and the tests by which you can distinguish between them and can determine their

qualities. (These tests were described in last month's "Journal.")

3. Examine "ready-to-wears" as thoroughly as possible to test for crushing, draping, and wearing qualities before buying.

4. Notice if the garment considered could be "made over" or remodelled, and if it has sufficient hem.

5. Consider your wardrobe as a whole. Note the general colour scheme, and then buy new garments which will "fit in" with the ones you have already. For instance, don't buy a brown frock when the only hat, gloves, shoes, and handbag you have are blue, unless, of course, you are prepared to buy a complete new set of accessories.

6. Beware of fashion fads, unless you have the type of purse which allows several new frocks every year. If your new coat has to last for three or four seasons, select a conservative style which can be just as smart as one of "Dame Fashion's" extremes.

7. Know your type and buy accordingly. Remember that just because a garment looks well on the fashion model or on Mrs. X it will not necessarily look well on you.

8. Buy the best you can afford, and then take care of it. One good garment may outwear two cheap ones, and it will always look and feel better.

9. Beware of so-called "bargains."

10. Use advertisements intelligently. Don't believe ALL they tell you.

Kitchen Equipment

From clothing to kitchen equipment may seem rather a "jump," but it isn't such a big one when it's all paid for out of the same pocket. And just as there is an art in buying the one, so is there an art of purchasing the kind of equipment which will give you the best return for your money.

Again, it is largely a matter of studying your real needs, knowing relative values, and then spending what you can really afford. Again, too, there are certain points which, if we will but consider them, will help us in choosing all tools. They are:

1. Construction.—By which we mean size, shape, and material. Is the tool the right size and shape for your purpose? Is it made of material which will stand up to wear?

2. Efficiency.—Is the particular piece of equipment you are considering fitted to the task it is supposed to do? Does it take more time to use and care for than to do the job without it? In other words, does it save time and energy?

3. Utility.—What is the wearing capacity? Is it one tool which really does the work of several?

4. Economy.—Does it really justify the initial cost? Will it cost much in upkeep and repairs? Is it expensive to clean?

5. Need.—Is it really needed in your household? For example, a paring knife or a kitchen sink are needed more than a fancy vegetable cutter or costly cooking utensil.

Whether it is a paring knife or a refrigerator, a saucepan or a sewing machine, an egg-beater or a vacuum cleaner, consider these points. Examine it, ask questions about it, and then, having satisfied yourself that you really need it, buy the best you can afford.

Answers to Inquiries

Storage of Butter

"Waikanae Reader."—It is assumed that you have a knowledge of the method of manufacturing butter and therefore do not desire detailed advice in this respect. The ordinary precautions for the manufacture of butter must be strictly observed. The pasteurisation of the cream by standing it in a vessel in hot water and raising it to a temperature of 175 deg. F. and cooling before churning will assist in making good keeping butter. The addition of boracic acid as a preservative is permissible, but if it is intended to sell the butter it must not exceed 20 grains per lb., and a statement to this effect must be printed on the wrapper.

To store the butter, thoroughly scald the earthenware crocks, and then cool them. Ram the butter solidly into the crocks with a wooden rammer, and cover the top with butter-parchment and a layer of salt. Store in the coldest place available.

Fish Soup

SOUP is an excellent method of using up the otherwise inedible parts of fish, such as the skin, bones, head, etc. Compared with meat soup in general, it is of higher food value. When made from trimmings only it contains albumen gelatine, and the same bone and nerve building materials as found in the fish. If shell-fish is added the soup contains all the very valuable foods found in these. The prejudice against fish soups is due to a lack of knowledge of the properly prepared article. When once a well-made fish soup is tasted the objection is generally overcome.

Fish soup is easily made, nutritious, and very appetising. The water in which fish has been boiled should be used for soup, or for sauce to serve with fish.

Ingredients.

Fish, 2lb (approx.).
Butter, 1 oz.
Flour, 1 oz.
Milk, 1 pint.
Onion, 1.
Water, 1 pint.
Cloves and peppercorns, two or three.
Salt and pepper.

Method.—Clean and scale the fish and remove the skin. (To remove the skin, put the fish flat on paper or board and make a cut just through the skin above the tail. Hold the tail firmly on the board, and, with a cloth in the other hand, quickly tear off the skin up to the head.)

Remove the flesh as when filleting, and set aside in a cool place. Put head, skin, bones, etc., on to cook in the cold water; add onion, cloves, etc. Boil slowly for about one hour, and strain. Return the strained liquid to the saucepan and add the fish. Cook slowly until the fish is quite cooked—about twenty to thirty minutes. Work all through a soup-strainer and return to saucepan. Add milk and seasoning and stir in the butter and flour mixed to a smooth paste. Stir until boiling and serve with small dice of toasted or fried bread.

Any kind of fish may be used—red cod, red snapper, tarakihi, butterfish, etc.

Recommended Recipes

SPICK APPLE SOUFFLE.

1-3 cup quick-cooking tapioca.
½ cup sugar.
½ teaspoon salt.
2 cups milk.
2 tablespoons butter.
¼ teaspoon cinnamon.
¼ teaspoon nutmeg.
1½ tablespoons lemon juice.
1 cup grated raw apple.
3 egg yolks, beaten until thick.
3 egg whites, beaten stiff.

Method.—Combine the first four ingredients in the top of a double boiler. Place over rapidly boiling water, bring to scalding point, and then cook for five minutes, stirring frequently. Remove from fire. Add butter, spices, lemon juice, and apple. Let it cool sligthly, then add the egg yolks beaten until lemon coloured. Mix well. Fold in well-beaten egg whites. Turn into a greased baking dish, then place in a pan of hot water and bake in a moderate oven for about one hour or until souffle is firm. Serve hot with whipped cream. Eight servings.

SCALLOPED APPLES.

Tart apples.
Sugar.
Butter.
Buttered bread crumbs.

Method.—The apples for this dish should be of a tart, firm variety. Pare, core, and slice the apples. Place a layer of apples in a buttered baking dish. Sprinkle with sugar. Dot with butter. Place another layer of apple over this. Then sprinkle that layer with sugar and dot with butter. Repeat this until the apples, sugar, and butter fill the baking dish. Cover the dish and bake for one hour. Remove the cover, spread buttered bread crumbs over the top, and return to the oven to brown the crumbs. When the apples are done they will be in slices just as they were when they went into the dish, but they will be almost clear enough to see through. Serve hot with hard sauce or cold with whipped cream.

ARTICHOKE SOUP

4 cups boiling water.
2 tablespoons flour.
Few grains cayenne.
1 cup scalded cream.
2 cucumbers, pared and cut in 1-3in cubes.
2 tablespoons butter.
1½ teaspoons salt.
Few gratings nutmeg.
1 egg slightly beaten.

Method.—Cook artichokes in boiling water until soft and rub through sieve. Melt butter, add flour and seasonings, pour on hot liquor, and cook one minute. Add cream, egg, and cucumber fried (sauteed) in butter.

CHICKEN FRICASSEE.

4lb fowl cut in pieces for serving, leaving breast whole.
Salt and pepper.
Flour for dredging.
Butter or pork fat.
4 tablespoons flour.

Method.—Cover fowl with boiling water, cook slowly until tender, one to one and a half hours, adding two teaspoons salt when half done. Remove from water, sprinkle with salt and pepper, dredge with flour, and fry (saute) in butter or pork fat. Reduce stock in pan to two cups. Melt butter, add flour, stir until well-blended, add stock gradually. Bring to boiling point and season. Arrange chicken on pieces of dry toast. Place on a hot platter having wings and second joints opposite other breast in centre of platter and drumsticks crossed just below second joints. Surround with sauce.

BOTTLED COCKERELS.

If the meat is canned on the bone it is good to serve as stewed, fricasseed, or chicken. If it is to be used in a salad or sandwiches it is more economical of space to remove the bones before canning or bottling.

STEWED CHICKEN.

Cut chicken into usual pieces, pack into hot jar, add one teaspoonful salt to each quart jar, partially seal, and process four hours in hot water bath or one hour in pressure cooker.

COOKED CHICKEN.

The chicken may be cooked until meat can be removed from the bones, packed and processed two hours in hot water bath or one hour in pressure cooker. The bony pieces, such as back and neck, may be canned in this manner and used for creamed rabbit or chicken or salad.

PUMKIN PIE.

1½ cups steamed and strained pumpkin.
2-3 cup brown sugar.
1 teaspoon cinnamon.
½ teaspoon ginger.
½ teaspoon salt.
2 eggs.
1½ cups milk.

Method.—Mix ingredients in order given and bake in one crust.

APPLE SAUCE CAKE WITH FIGS.

Method.—One cup sugar, one and one-half cups of unsweetened apple sauce, two tablespoons of butter combined with enough other shortening to make one-half cup, two cups of flour, one cup each of chopped figs, raisins, and nuts, one teaspoon of cinnamon, cloves, nutmeg, and allspice, one teaspoon of soda dissolved in a little water. Mix to a stiff batter. Bake in a square loaf pan for one and one-half hours.

APPLE MERINGUE DAINTY.

1 pint hot sweetened apple sauce.
2-3 teaspoon cinnamon.
1-3 teaspoon nutmeg.
1 tablespoon butter.
2 tablespoons powdered sugar.
2 eggs, separated.

Method.—Add the spice, butter, and sugar to the hot apple sauce. Pour the sauce over the beaten yolks of the eggs, stirring constantly. Pour into a buttered baking dish and bake for ten minutes in a moderate oven. Cover with a meringue made of the egg whites and brown the meringue in a slow oven. This dessert may be served either hot or cold with whipped cream or custard sauce.

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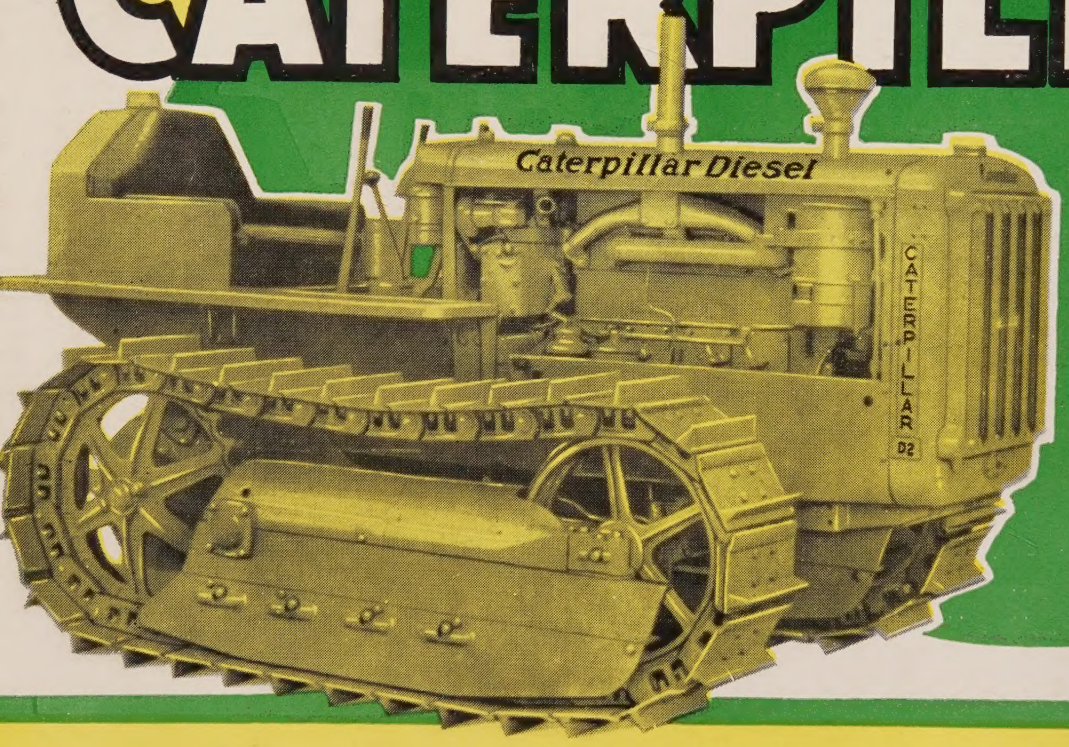

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